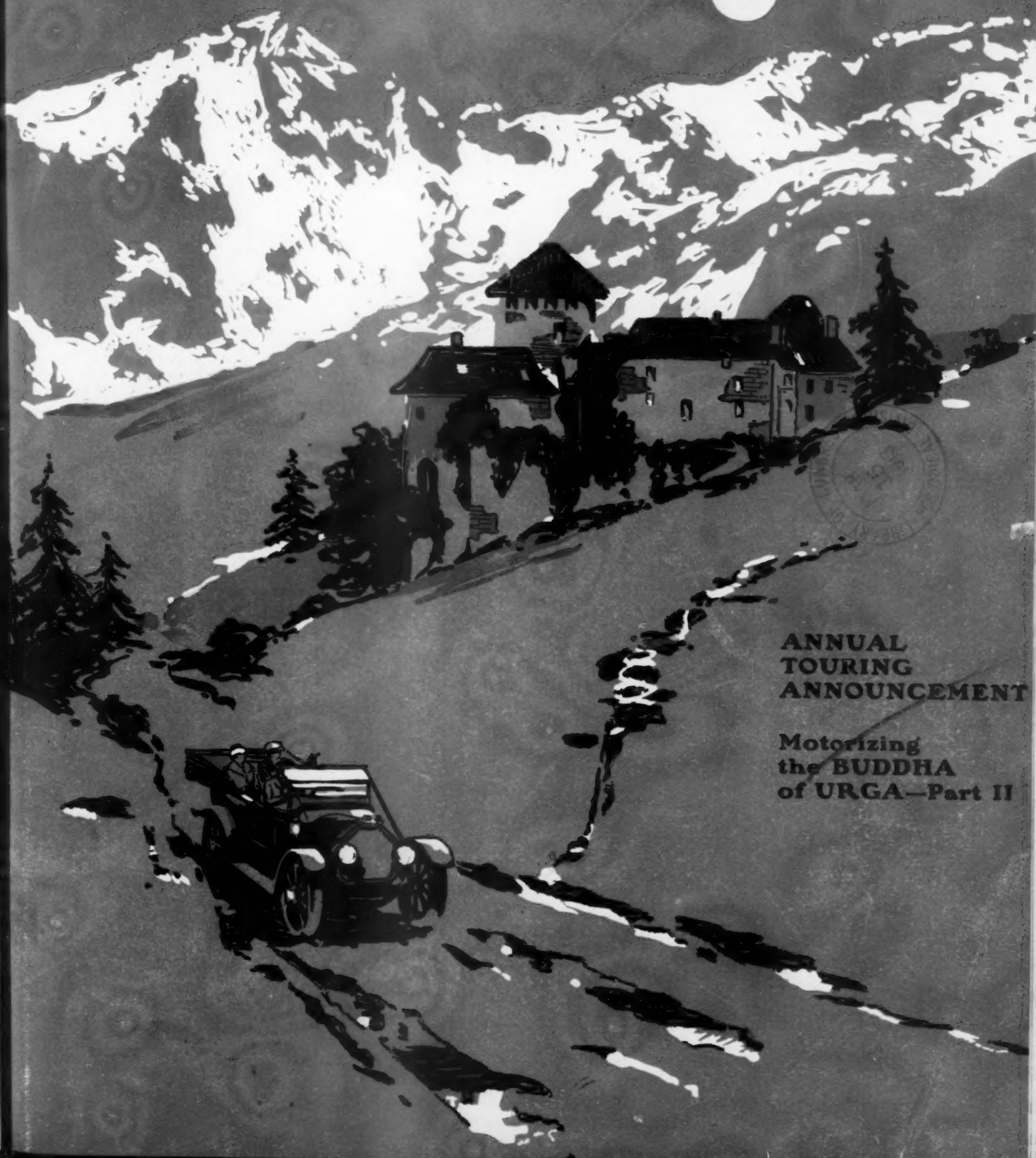


March 13, 1913

Price 10 Cent

# MOTOR AGE



ANNUAL  
TOURING  
ANNOUNCEMENT

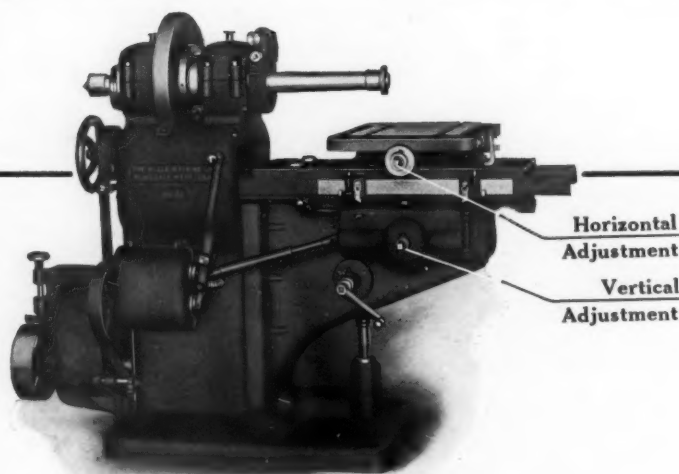
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the BUDDHA  
of URGA—Part II

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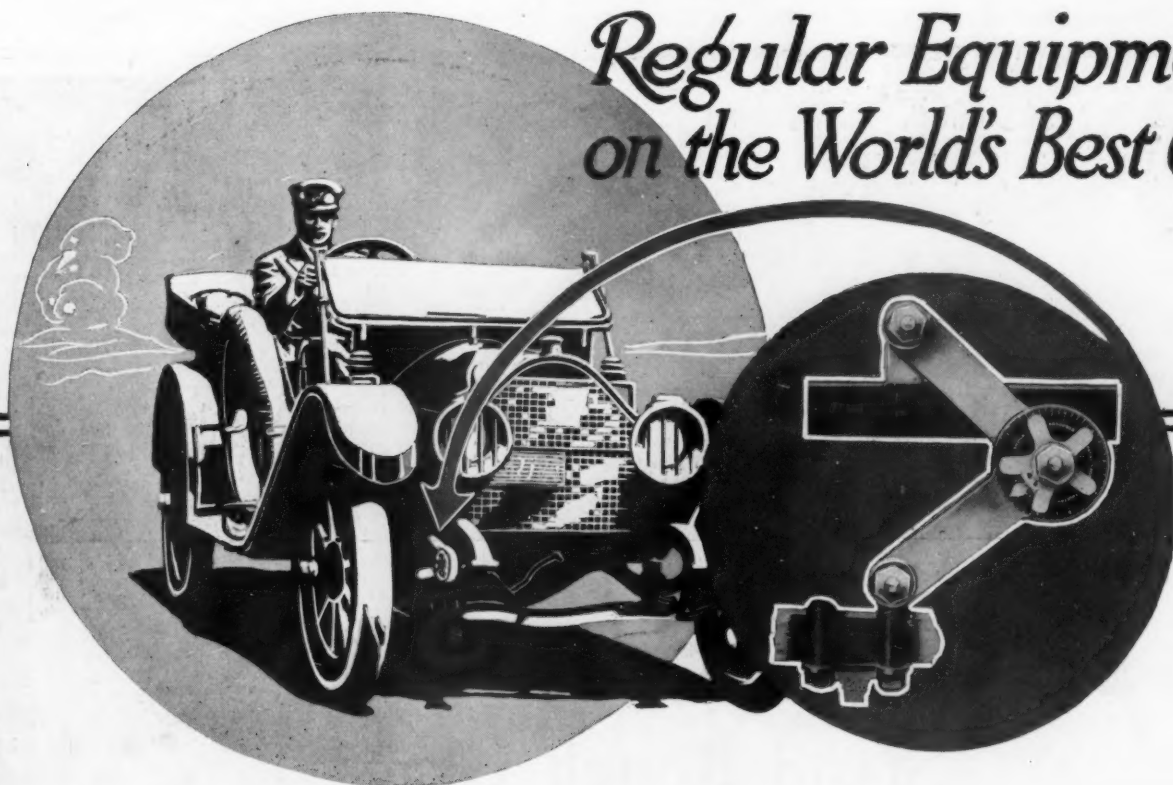
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*Manufacturers of Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers*

**Office and Works, Jersey City, N. J.**

*Branch Offices and Dealers Everywhere*

*When Writing to Advertisers, Please Mention Motor Age.*



Published by the  
CLASS JOURNAL COMPANY  
910 South Michigan Avenue  
CHICAGO ILLINOIS

Volume XXIII

MARCH 13, 1913

No. 10

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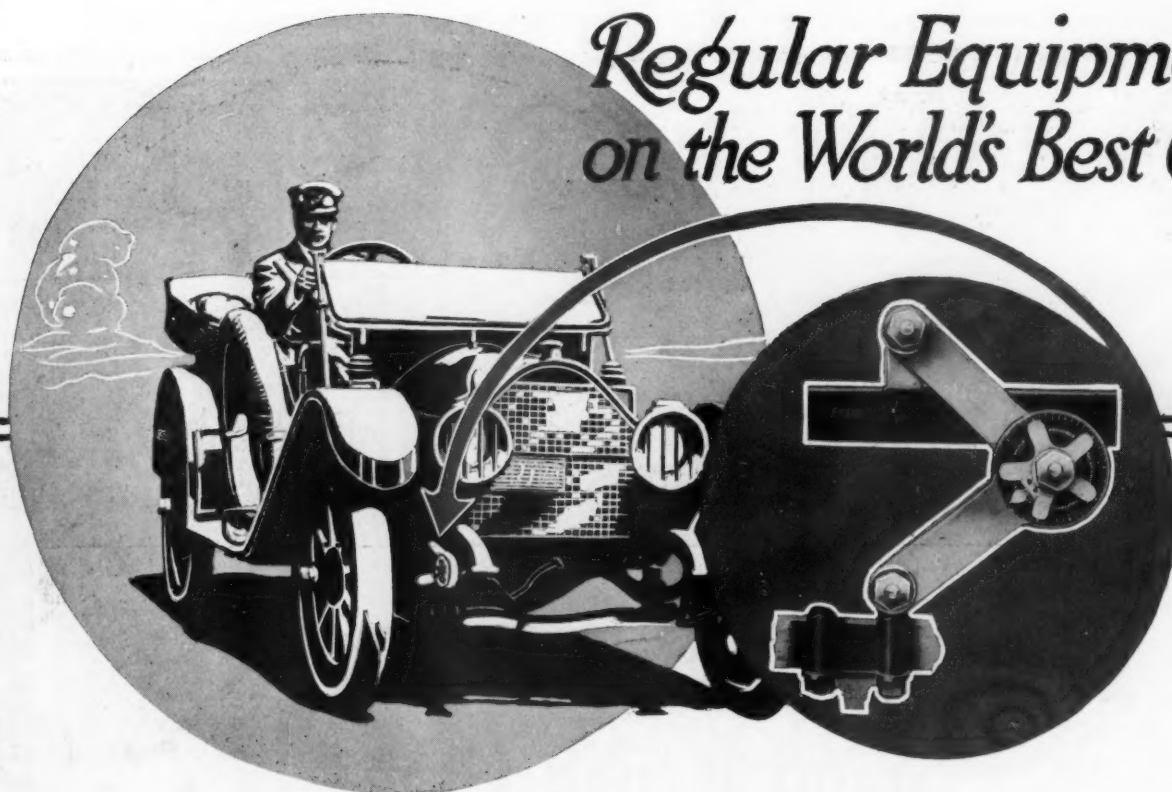
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## STARTING—LIGHTING

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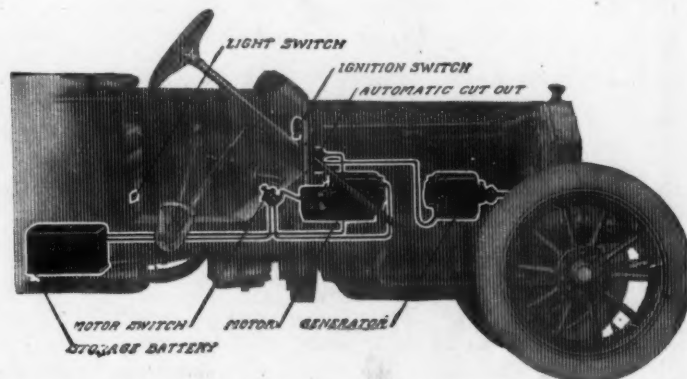
And what reputable automobile maker, in order to save \$50 or \$100, would deny you your choice of Electric Starters?

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**The Disco Company, 710 Dodge Bldg., Detroit, U. S. A.**



# MOTOR AGE

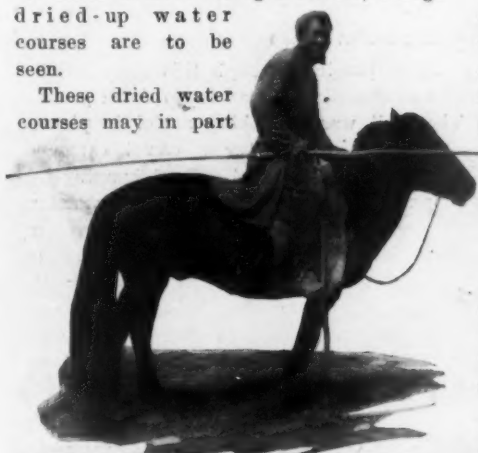
## Motorizing the Buddha of Urga



Chinese on the way to their homes from Kiachta, Mongolia. They are drawing their carts, five men to a cart, a distance of over 800 miles

WITH the help of the nurse and the missionary on the tackle, and the two Chinese who were in the water pushing at the back of the car, we arrived on dry land again all in one piece. After this strenuous pull we had lunch. Then we washed the car, as this was the last stream we should cross until we reached Urga. Some of the mud we had collected in the past 3 days was like cement and almost impossible to get off. On the Gobi desert one may ride 600 miles without seeing a stream, though dried-up water courses are to be seen.

These dried water courses may in part



A Mongolian horseman, with his long pole used to catch wild horses

By Ethan C. Le Munyon  
Part II

(Continued from February 27)

be accounted for by the fact that when it rains in hot weather the water sometimes is dissipated in steam before it reaches the ground. At a little distance one may see it raining hard but upon reaching the spot the ground will evidence plainly that no moisture has reached it.

We were now on hard roads again and after paying the carter in lump silver, which we weighed out to the amount agreed upon, we packed all the baggage in the car, gave some tobacco to some Mongols who had helped us, and hit the trail once more.

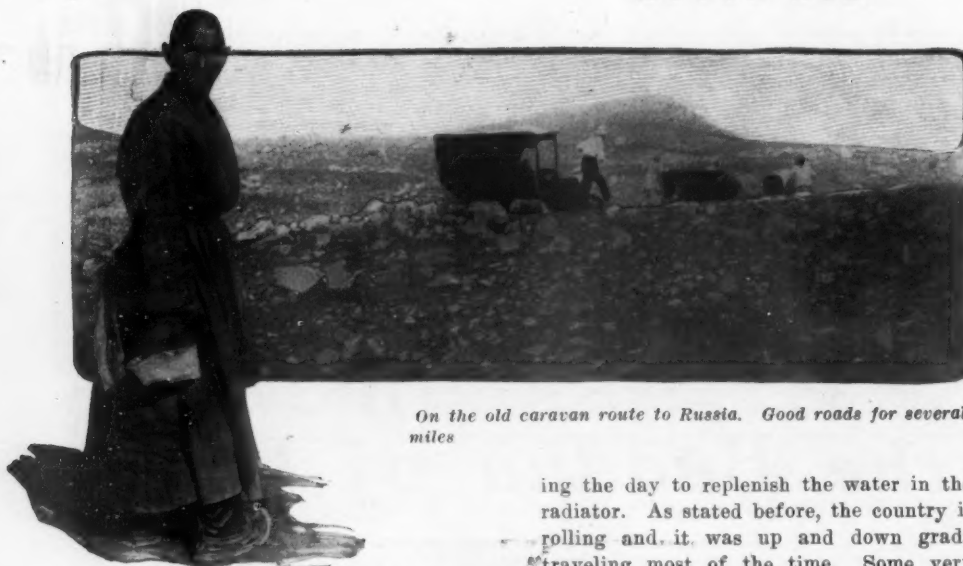
We stopped at a well to replenish our water supply. The radiator had boiled continually and evaporated a great deal of water, which had to be replaced from time to time. This well was about 70 feet deep

and was a dug well. The windlass was a crooked branch with a wood drum on which the rope was wound. This was so built that all the working parts could be taken into the owner's tent after the required amount of water had been drawn. If the windlass was left out over night it might be stolen for the wood, as there is no wood in this part of the country. The bucket was a piece of bullock hide just as it was taken off the animal, with the hair on the inside of the bucket, which was sewn up on one side with a rawhide string. As it had been in use for some little time and the hair was becoming loose, some of it came out each time the bucket was used, and it was not quite what would be termed sanitary in America. But it quenched our thirst.

These wells in the desert are named as towns might be, and are quite as important to the traveler. The water is brackish and seems to lie quite near the surface, although the well just described was 70 feet deep.

Tab Ol—Mongolian for five peaks—was reached that evening at 5 o'clock. This is the summer home of Mr. Larsen, of Kalgan, through whose influence the order for the car was placed. Mr. Larsen is a missionary who has spent 18 years in this

Editor's Note: This is the second and final installment of the story of the trip made by Ethan C. Le Munyon, who delivered to the Buddha of Urga an American car which the Living God had purchased. The first article was published in Motor Age February 27.



On the old caravan route to Russia. Good roads for several miles

A typical Mongolian. The shaved head denotes that he is a Lama.

country and is the best known and respected foreigner in Mongolia. He has a small Chinese house at Tab Ol. There also are at this place a few Mongolian tents, or yurtas, occupied by Mongols, who look after Mr. Larsen's large herd of horses. We also saw many camels. These yurtas, or native tents, in the form of circular mounds are built of a framework of lattice which is covered with thick felt. They are wind and water-proof and portable. There always is the same arrangement of articles inside, the gods or idols being placed opposite the opening, and a yurta must be approached from directly in front of the doorway. The fire is built in the center of the tent.

#### Stop Made at Tab Ol

We spent the night at Tab Ol. The country here is rolling and the weather was cool so it was very pleasant. The altitude is 4,500 to 5,000 feet. In this high altitude and dry weather there is much electricity in the air. Mrs. Larsen lives at Tab Ol and this was the nurse's destination. Mr. Larsen had left 7 days before for Urga with the camel caravan. About 2 weeks before he had sent a caravan to Urga with instructions to leave a 10-gallon drum of gasoline at each of three points in the way across the desert, the balance of the shipment going to Urga for the future use of the god. The day of September 26 was spent at Tab Ol. Necessary adjustments were made on the car, tires pumped up, loose belts tightened and one of the gas lamp pipes repaired where it had been broken, due to excessive vibration and a jam against a stone. We were now 87 miles from the end of the railway at Kalgan and, as it proved later, over the worst part of the trip.

#### Horse Vs. Motor Car

On leaving, on Wednesday, the 27th, a Mongol horseman by the name of Eternity rode along beside the car for 8 miles to try his horse, which proved a good one but hardly equal to a motor car for endurance. Stops were made at wells dur-

ing the day to replenish the water in the radiator. As stated before, the country is rolling and it was up and down grade traveling most of the time. Some very steep hills were encountered where it was necessary to let the car down on low gear with the current shut off, using compression.

#### The Overland Limited

Later in the day we reached a level plain where the road was quite good. Here we passed a camel cart. These are the Overland Limited passenger coaches of Asia. The camel cart is larger than the famous Peking cart, otherwise it looks the same. The top of the cart is covered with felt, and traveling in cold weather is not uncomfortable to the occupant if he does not mind a few bumps, for there are no springs to the cart.

Pankiang, the Chinese telegraph station, which constitutes the town and is three buildings in one, was reached about 5 o'clock in the evening. Here we found the first of the 10-gallon cans of gasoline shipped by Mr. Larsen by the camel caravan 2 weeks before. We were entertained by the Chinese operator, and spent the night in the guest room, which is reserved for officials traveling in Mongolia on government business. This station is one of the telegraph line which the Chinese gov-



Mongolian women of southern or inner Mongolia. Heavy silver ornaments and coral beads in their hair. Mother and daughter

ernment operates between Kalgan, Urga and Kiachta. This was the first station in the desert, 180 miles from Kalgan.

#### In the Gobi Desert

Leaving Pankiang—altitude 5,600 feet—on the morning of the 28th, with Mr. Larsen 6 days ahead of us, according to the operator, we met a few travelers returning from Urga, and passed droves of grazing horses. About noon we stopped at a well to take on water. We were now on the Gobi proper. Many interested Mongols at this spot crowded around the car, and some said: "It's just like the railroad; the railway has come at last." The women we saw had their hair adorned with silver ornaments. They were the women of inner Mongolia and their hair dress was more after the style of the Chinese.

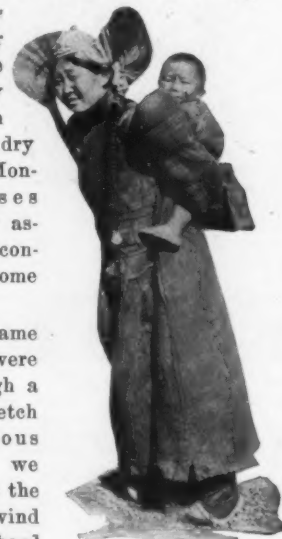
A Mongol temple was passed during the day. This was the first temple we had seen which was built after the Tibetan style of architecture, wide walls gradually sloping in toward the roof. These temples are indescribably dirty. Later in the day we came to a heavy grade with deep, loose, dry sand. Two Mongols on horses gave us their assistance for a consideration of some silver coins.

Darkness came on while we were passing through a very rocky stretch of mountainous country, so we camped beside the trail. The wind was blowing hard and it was very cold. We slept beside the car. During the night the wind blew the blankets off and carried them about the distance of a city block before we could recover them. With a drink of cold water from our water tin for breakfast the next morning, we did not delay in getting started.

#### Going Down Grade

After passing through this small range of mountains we began to go down grade. The trail was something awful in places only wide enough for a camel caravan to pass single file, and full of jumping-off places, or chuck-holes. It was a wonder that we were not wrecked, but not even a spring was broken. In places the lower side of the road, or trail, was fully 12 inches, and sometimes 18 inches, lower than the upper side, so that Mr. A. was forced to stand on the running board to keep us right side up.

After passing through a long stretch of sand, we reached Udde at 3,000 feet altitude. This is the second telegraph station, and is composed of a group of Chi-



Mongolian woman and child



nese buildings for the telegraph staff and their wives and children. There were also two or three line repairmen and some Mongol line soldiers who patrol the telegraph line. We were now 328 miles from Kalgan, which is half way to Urga. The station Udde is about 1 mile from the main route, around the base of a mountain. The writer telegraphed his firm in Teintsin from here that all was well.

#### Some Good Roads Encountered

After a good, hearty dinner we took the muffler off the car, so as to give us as much power as possible and also to keep the engine cool, and hit the trail again. During the afternoon we traveled over some very good roads, but they were full of pitch holes so fast driving was out of the question. Antelope were sighted several times during the afternoon. Animal life on the desert is even more scant than vegetation, although in addition to antelope, marmot and wolves are sometimes seen, also sand grouse. The yak is found near the Tola river on which Urga is located. Wild duck, which at some seasons of the year are found in large flocks near Peking, migrate in summer to the Gobi desert.

About dark we overtook Mr. Larsen and his caravan. The missionary's wife and children were in the caravan, by which they were traveling to Urga where all of them were to be stationed during the winter. Mr. Larsen's Mongol cook prepared our supper and that night we slept in Mr. Larsen's tent as we had none ourselves.

The following morning, Saturday, September 30, we started early, accompanied by Mr. Larsen for some time. We had run ahead some distance with our car when a drove of about 500 antelope were sighted grazing about a mile away. We waited until the caravan and saddle horses came up, and two of us mounting set out after them. We chased them about 3 miles and succeeded in shooting one. This furnished us with fresh meat of the best quality. A peculiar thing about the antelope is that when startled from their grazing, instead of fleeing directly away from the object of their fright, they will invariably cross its path first and then gallop away like the wind. Hunters familiar with their habits take advantage of this unusual action. That day we saw a couple of foxes.

About noon we again stopped at a well and took on water. Shortly afterwards we began a climb of 5 miles' gradual rise to a plain about 30 miles wide. The roads were quite good with the exception of the chuck holes caused by summer rains. There also were a great many bleached bones of animals in the beaten track, which we sometimes ran over, as we



Mongolians. Their first sight of a motor car. They said, "The railway has come at last."

could not always avoid them. We had no fear for the back wheels which were equipped with treads.

#### Alkali Lakes Passed

Late in the afternoon several small alkali lakes were passed. While negotiating the deep sand in a dry river bed the starting crank pin came out and broke the fan belt. This caused some delay. As there was a cold head wind blowing we did not try to replace the fan but took it off, and the rest of the distance was made without the use of the radiator fan. A cold rain began before we could get out of the river bed. Not wishing to get caught in such a place in a heavy rain, needless to say, we hustled out of there as soon as possible and drove as long as we could see.

During the warmer months much travel on the desert is by night, the caravans starting out by 2 or 3 o'clock in the morning, resting through the heat of the day and resuming travel toward sundown when it is cooler.

We now came to a mountainous country again, and seeing it would be impossible to reach the next telegraph station that night, the car was stopped on top of a high hill and about 100 feet from the trail. During the night a string of ninety-five bullock carts loaded with lumber passed us on their way from Urga. The ground was too wet to sleep on, so we sat up in



A prayer wheel shed. The Mongol is walking around the wheel praying; that is, he turns the wheel

the car all night, and breakfasted in the morning on a drink of cold water. The car started a little harder than usual on account of the very cold night. Everything was chilled through, including ourselves.

#### A Large Llama Llamasary

Sume, a large llama llamasary, was reached about 9 o'clock a. m. Here we were supposed to find our last tin of gasoline but no one seemed to know anything about it. So after making all inquiries possible we drove the car over the top of the mountain north of the temple to

the third and last telegraph station, called Tourin. This is at an altitude of 4,800 feet and is about 3 miles from the main caravan route which we were trying to follow. No one at the telegraph station knew anything about the gasoline, so we returned to the temple and after wasting about 3 hours found the tin at the second temple, there being two large ones here, which was located quite



The Overland Limited of the Gobi desert. The most comfortable method of travel in cold weather, as the cart is covered with thick felt. There are no springs and there is an awful swaying motion as the motive power is only about a cycle and a half





*Characteristic scene, giving a good idea of the temple architecture*

near the first one we had visited. This monastery, for such the llamasary is, near Tourin, is one of the most important in outer Mongolia. About 2,000 llamas are connected with it. These llamas are priests of the Buddhist faith and are the curse of Mongolia. They are parasites living on the religious credulity of their lay brethren whose blind fanaticism savors of some of the religious cranks of the present day in our own country. Nearly every third man in Mongolia is a llama and according to the tenets of their religion are forbidden either to marry or to fight. This in a long measure accounts for the deterioration of the warlike spirit of the Mongol conquerors.

Some llamas live in temples, or monasteries, while others live in the ordinary yurtas, or felt tents, and lead the same sort of life as the ordinary people; that is, they help to attend to the flocks of sheep and the herds. The temple llama lead the same sort of life as those sometimes seen by travelers who visit the llama temple in Peking. The temple llamas are of a much lower type morally and physically; they are coarse, filthy and also treacherous. This cannot always be said of the other class, for the llamas living in tents are well respected and are of a better class.

#### **Llama Priest Is Popular**

Many families, even among the nomadic tribes, have their own llama priest who lives with them and naturally is taken with them in all their wanderings. They spend their time in indolence. The monastery also serves as a school, and here will be seen llamas of all degrees of dirt together with the young boys who are studying to become llamas. There are two llamasaries at Tourin where more than 10,000 llamas are congregated. This is about 600 miles from Kalgan.

October 1, after securing our gasoline at the second monastery, we proceeded toward Urga. Soon after starting we forded a

small stream, then began to climb to a wide plain. The meaning of the word Gobi being "dried up sea," one can conceive its form as being that of a basin. We had climbed over one edge of it as we came up from Kalgan and through the following mountainous country, then had descended to a plain, and now we must make our way up the far side. We were informed by some travelers we met that when we reached the plain ahead of us we would find better roads—that they would be quite smooth. We had to ride against a strong head wind and had it not been for our fur coats we would have suffered greatly from the cold. The wind blew so hard that on the up grades it was almost impossible to drive the car in high gear and make any speed. The sort of switchback roads which we were then traveling lasted for a couple of hours or more, but after we reached the plain we were enabled to average 25 miles an hour for 2 or 3 hours. On this high, grassy plain we saw hundreds of antelope in herds of from five to fifty. They became frightened at the car and ran ahead of us, sometimes crossing the trail about 100 yards in front of the car.

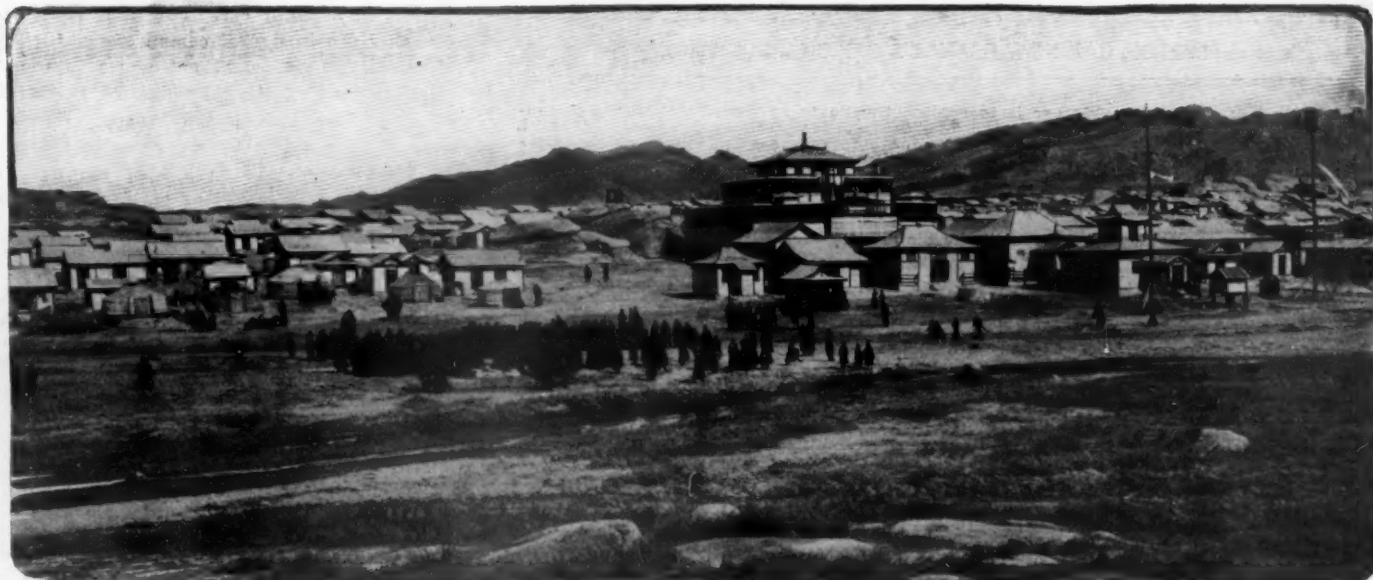
About sundown the road became very rough and hilly, and several soft places were passed over where the water came out of the ground as seepage. These places were on hillsides and all indications pointed toward this being a good artesian country, where plenty of water may be developed for farming and other purposes when this part of the country is settled by an agricultural people, probably Chinese and Russians. This era is bound to come very soon, for the famines in China are driving the people to new and more productive locations, and every year sees more and more of them in Mongolia.

#### **Cold Night in the Desert**

As we saw it would be impossible to reach Urga that night, we stopped the car near the trail, ate some canned goods for supper, and after draining the radiator of the car, settled ourselves to sit up all night in the car wrapped in our fur coats and blankets. The ground froze very hard during the night. In the morning we cooked our breakfast, made some tea—our coffee had been left at Tab Ol by mistake. Refilling the radiator, we started about 9 o'clock. Traveling first through hills which were covered with grass, we dipped



*The residence of the god, where he received the writer and the car. This is the most inferior of his three palaces*



A temple at Urga. The Holy mountain covered with snow in the distance is called Bogda Ol, or Buddha's mountain

down into the valleys, where we encountered water and marshy ground.

In going across one bad marshy place the car broke through the frozen ground and the spaces between the rivets of the treads being filled with thick, slippery mud, it was necessary to wind long lengths of rope around the tires to obtain traction.

#### Working Their Passage

Even this did not work in one case and we had to shovel trenches for each wheel for about 75 feet to reach solid ground; otherwise the wheels would cut through the grass into the mud and spin around without moving the car. Two small lakes were passed and we saw a great many wild fowl near these lakes and in the marshy country.

Game is common near Urga, but hunting on the Sacred Mountain, Bogda Ol, is prohibited. The Tibetan yak is used as a beast of burden, as well as for its milk.

Just before we reached the Tola river it was necessary to climb some very steep grades and run along the side of the mountain, where the car threatened to tip over at any moment. Groups of yurtas were passed from time to time. The women seen here dressed their hair differently from the women of southern, or inner,

Mongolia, but the men wear theirs the same.

Most of the down grades were so steep it was necessary to take them under compression, using the brakes at the same time. Finally the banks of the Tola were reached and we passed over the Russian bridge, which is built of logs. The river at this point is about 300 feet wide and from 5 to 10 feet deep at this time of the year. The surrounding mountains were covered with a forest of larch. After crossing the bridge and going up the bed of the river, fording the smaller tributaries from time to time, we reached Mai-Mai-Chen, the Chinese village of Urga, and the place where we were to meet Mr. Larsen.

#### Mai-Mai-Chen a Business City

The city of Mai-Mai-Chen is the business place, as its name signifies. It is about 5 miles east of Urga proper, where the Mongol temples and the Russian traders are located. The Chinese telegraph station and a branch of the Ta Ching bank—Government Bank of China—are located here, as well as a yamen of the Chinese magistrate. On our arrival we called at the yamen, which is the magistrate's official residence, and presented our passports, which had enabled us to travel in Chinese

territory. He was satisfied with the same and we were asked no further questions.

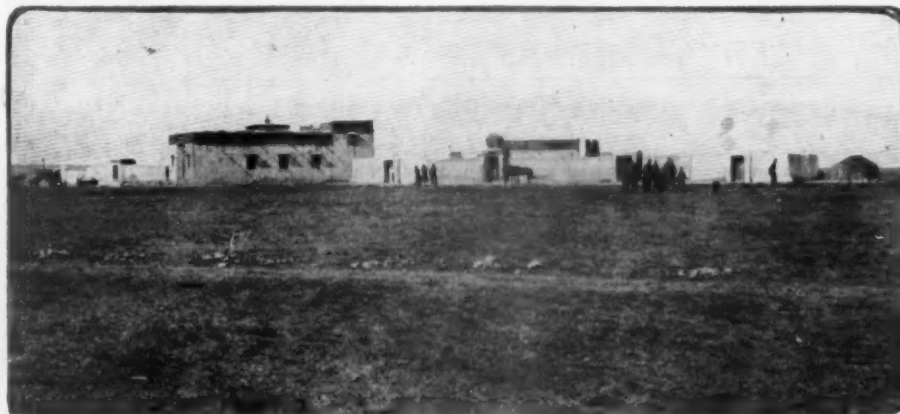
The city of Urga is located at latitude 48 degrees 20 minutes north, 107 degrees, 31 minutes east longitude. It is situated in a valley about 10 miles long, formed by the widening of the Tola river. The population is hard to determine. There are countless temples, and during the season of the year when the writer was there were congregated about 20,000 llamas and long lines of prayer wheels beside the road. These prayer wheels are set in shanties. Prayer flags float over all the tents and temples, and gilt prayer wheels at the tops of the temples swing in the breeze. To say a prayer by whirling a wheel is just as effective, according to their religion, as any other method. One of the temples contains the shrine of Maidari—the future ruler of the world—an image of metal 33 feet high, and said to weigh 125 tons. It was cast in sections and brought from Dolon Nor, 600 miles east of Urga.

#### Urga a Town of Stockades

Urga is a town of stockades, placed here and there, as the three powers, Russian, Mongolian and Chinese, keep jealous eye upon one another. These stockades are made of logs set upon end. Russia maintains a post office and consulate in Urga, also quite a large military force to protect her interests in the tea trade which passes through here by caravan to Kiachta. She is also interested in the wool and fur trade.

The medium of exchange is the Chinese unit of weight, or tael—an ounce of silver. Small squares or cubes of this metal are used in some parts, but brick tea will pass current everywhere. Tobacco also is of considerable bartering value. Almost all of the trading is in the hands of the Chinese, with the exception of that handled by a few Russian traders in Urga.

Urga is the Russian name for the city, signifying palace. Hurai is the name given by the Mongolians, while, as we have



Mongolian temple. Tibetan style of architecture



### MOTOR CAR NOW FRANCE'S OFFICIAL EQUIPAGE

PARIS, Feb. 25.—The motor car is to replace the horse as the official means of conveyance at the French Elysée, according to an order given by President Poincaré. Presidents Loubet and Fallières had no love for the motor car and on all official occasions drove behind a team of horses with postillions. Ex-President Fallières was the owner of an old-type car, but very rarely made use of it. All this has now been changed, for when M. Poincaré became president he gave orders that the number of horses should be reduced from twelve to four, these latter to be used principally by Madame Poincaré.

On all occasions the president will use his private car, a Panhard limousine. The head postillion at the Elysée, who served under Presidents Loubet and Fallières, has resigned. Orders also have been given that the police must not interrupt the normal flow of traffic in order to give right of way to the president's car or to any other cars attached to the presidency. These cars will be treated in the same way as all other vehicles. The drivers, however, can claim a right of way in cases of necessity by showing their police pass to the officer on duty.

During the last few days he was in office Ex-President Fallières appears to have been converted to the value of the motor car, for before leaving the presidency he declared that he had traveled a lot but had seen little, having been obliged to make use of the railway. He has now bought a modern car and in company with his son intends to spend a large amount of time touring through France.

(Continued from page 9)

already stated, the Chinese portion is Mai-Mai-Chen. An these three cities in one are surrounded by mountains.

Upon arriving at Mai-Mai-Chen we gave the car a thorough inspection, tightened all bolts, cleaned the spark plugs and washed the outside of the car, covered it up and waited for instruction from the god to deliver it. Time is without value among the Mongols, and the higher up the official the longer it takes to deal with him. Needless to say, the car was a 7-day wonder with the natives of Urga.

Before delivering it we drove over to call on the Mongol prince who has charge of the ordinary business affairs of the god, to show him the car. He was quite pleased with it. While we had the car in the compound where we were stopping the writer wired the car so he could ground one side of the spark coil on the ground by a small chain, and as the other side already was grounded on the frame of the car, we had considerable fun at the expense of the natives who put their hands on the metal parts of the car.

The Buddha, or living god, to whom the car was delivered is the second in importance in the Buddhist faith, and the political head of Mongolia. He is short in stature and is almost blind.

The trip across Mongolia was accomplished without an accident to the car, and without tire trouble of any kind; and with the exception of two small cuts in the casing on one of the front wheels they showed very little wear.

After delivering the car to the god, the writer left for Kiachta and the Trans-Siberian railway by Russian tarantass. This is the general name for a Russian four-wheeled cart without springs, drawn by three horses hitched abreast. He traveled 4 days and nights, with very little rest, to reach Kiachta, and a few hours more to reach the steamer at East Kiachta on the Selenga river. During this trip frequent stops were made at Mongol tents to rest the horses and feed them. A branch of the Okaron river was ferried. Religious carins or obos were passed on the highest hills. Here all devout Mongols leave a stick or stone or bunch of horse-

### Wilson and His Motor Cars Next Inaugural Will See Elimination of the Horse Vehicles

WASHINGTON, D. C., March 8.—Contrary to expectations, President Wilson did not make his triumphant appearance in the parade down Pennsylvania avenue after taking the oath of office, in a motor car. Instead he and Former President Taft used a large carriage pulled by four horses. The only part taken in the inaugural parade by the motor car was the use of six Packard cars that were sent several blocks ahead of the parade to clear the streets, police officials being in each car. Members of Mr. Wilson's family were conveyed from the capitol to the White House in the White House motor cars, but they did not figure in the parade in any way.

When President Taft discarded all the White House horses and carriages and announced that the motor car would be the official vehicle of his administration it was believed that when his successor was inducted into office both would ride in the

hair as evidence of religious feelings.

After a night and a day on the small steamer, we reached the Trans-Siberian railway at Verkhue Urdinsk. This is the first station east of Lake Baikal. From this point the writer returned to Tientsin by train, arriving in that city on October 22 at 4:30 a. m., less than 32 days after

parade in a motor car. For some reason or other the inaugural committee decided that motor cars would not figure in the parade. Instead the time-honored custom of a carriage and four was used. However, the prediction has been freely made in Washington this week that the next inaugural parade would be marked by the appearance of the president in state in a motor car.

The motor car equipment which was used by Ex-President Taft consists of three Pierce-Arrow cars. One of these is a 60-horsepower touring car, another a limousine of the same power and the third a 38-horsepower landaulet. All of these cars are six-cylinders and each has a replica of the great seal of the United States on the door panels. It is understood another car, presumably a Pierce-Arrow, will be added to the fleet within the next few days. In addition a Baker electric was used by Mrs. Taft and Miss Helen Taft, and a Baker truck for carrying mail matter. A Pierce-Arrow landaulet also was used by Taft's secretary, and it is presumed Wilson's secretary, Thomas Tully, will continue to use it.

Abel F. Long is the chauffeur in charge of the White House cars, which are garaged in the stables of the quartermaster's department a few blocks away from the White House. He was selected from among 5,000 employes of the Pierce-Arrow factory as the best man for the position and has been employed by the government in this capacity since February 23, 1909. F. H. Robinson is second in command. The third man is Richard Burlasque.

There are a great many disadvantages connected with the garaging of the president's cars in their present location and it is expected a garage for their exclusive use will be erected during President Wilson's administration and that it will be kept filled.

his departure, during which time he had traveled more than 1,200 miles overland by conveyances other than a railway, the total distance covered being about 3,300 miles. During this time 1 day was spent at Tab Ol and 7 days in Urga when no traveling was done, also a day and a night between Urga and the railway.

### MEXICO'S NEW PRESIDENT BELIEVES IN MOTOR CAR

MEXICO CITY, Mex., March 8.—Provisional President Victoriano Huerta is devoted to the use of the motor car. During the long campaign which he waged in northern Mexico as commander of the division of the federal army that sought to put down the rebellion that Pascual Orozco, Jr., and his cohorts were carrying on General Huerta kept with him as a part of his personal equipment four motor cars. He used for his long distance trips a big, blue Protos car of the same type Emperor William of Germany is said to occupy when he attends the war maneuvers.

By the use of these cars General Huerta was able to make flying trips to points some distance off the line of the railroad and to keep in constant touch with the different organizations of his army. He often drove the cars himself and is said to take the keenest enjoyment in this method of travel. The roads in the state of Chihuahua, where he carried on his campaign principally, are not any too good, but this did not deter him from going on long jaunts through the country.

Since he became provisional president, General Huerta has made almost daily use of his Protos car in this city. He believes that the adoption of motor cars for the general use of officers of the army is an innovation that is desirable from a practical standpoint and it is probable that he will make recommendations to congress for an appropriation to purchase a large number of cars for this purpose.

President Huerta also is an advocate of better roads for the republic and through his efforts this department of internal improvements will be made much more efficient than it has been in the past, it is stated.



# Uncle Sam Listens to Federal Aid Cry

Convention of A. A. A. at Washington Does Much Good—Congress Expected to Act During April Meeting—Congressman Shackelford Arouses Ire of Delegates by Classing Motorists as Highbrows—Interesting Sessions Held at the Nation's Capitol

WASHINGTON, D. C., March 8—With delegates from forty-two states in attendance and with unbounded enthusiasm existing all throughout the 2-days' session, the second annual federal aid good roads convention of the American Automobile Association opened here March 6 and closed March 7, after five sessions had been held.

Many strong arguments to support the proposition that the federal government should aid in the construction of highways were made and the convention closed with the adoption of a number of resolutions that are sure to receive the careful consideration of the sixty-third congress, which will convene April 1 in extra session.

## Speare's Resolutions

The resolution committee, of which L. R. Speare, of Boston, was chairman, brought in the following resolutions, which were adopted:

WHEREAS, In the development of our country's transporting appliances for man and goods from place to place, it has become almost the universal will of the people of the United States for better roads; therefore, be it

Resolved, That we recommend our federal government to build and maintain an interstate system of highways connecting the capitals of the various states and with the national capital.

Resolved, That we advocate the creation, wherever they do not now exist, of effective state departments of highways, in the various states and that a copy of this resolution be sent to the governor of each state.

WHEREAS, Federal aid for good roads has become of such national interest and importance; and,

WHEREAS, The second national federal aid for good roads convention feels that this subject should be considered by congress with the greatest care; therefore, be it

Resolved, That congress be respectfully requested to create a standing committee on national roads.

The big fight of the convention came during the concluding session on March 7. A resolution, introduced by Judge Lowe, of Kansas City, president of the National Old Trails' Association, was the cause, the opposition being led by Representative Dorsey Shackelford, of Missouri, who, throughout the convention, voiced antagonistic arguments against the proposition of federal aid. Judge Lowe's resolution was as follows:

That the taxes, approximately, that were in existence in 1897 on tobacco, be restored, and used for the purpose of building a national system of highways.

## Shackelford Heard From

Congressman Shackelford promptly put in an amendment reading "that the money raised by this taxation be set apart as a fund to be applied to the construction or maintenance, or both, of such roads as congress shall give aid to by legislation." This amendment was promptly rejected and the original resolution of Judge Lowe adopted by a vote of 46 to 2, some of the delegates not voting.

By H. G. Ward

It will be remembered that the proposition of restoring the old tobacco taxes of 1879 was advanced at the first federal aid for good roads convention last year by Jesse Taylor, of Ohio, who carried the convention by storm in advocacy of this idea. However, it was passed over and subsequently was revived by Congressman Warburton, of Washington, who has introduced a bill in congress to restore such taxes.

The convention also authorized Chairman Speare's resolutions committee to appear before the joint committee of congress that is investigating the question of federal aid and represent the convention. The fact was also brought out that within the next 2 weeks the A. A. A. will open headquarters in Washington for the purpose of advancing the federal aid proposition.

The convention was opened by Laurens Enos, president of the A. A. A., who briefly outlined its purpose. He then introduced George C. Diehl, chairman of the good roads board, who acted as permanent chairman of the meeting. Several members of congress then addressed the meeting, including Representative Peter C. Ten Eyck, of Buffalo, who advanced the idea that "we are all here looking for capital to take back home to improve our highways"; Congressman Borland, of Missouri, who declared the good roads question was the most important question before the American people; Congressman J. A. Goulden, of New York city, who spoke strongly in advocacy of the creation of a new standing committee in congress to handle the good roads question; C. Gordon Reel, state superintendent of highways of New York, who was dismissed from office by Governor Sulzer, during the convention; Professor H. J. Patterson, of the Maryland Agricultural College.

## Call on the President

At 2:30 o'clock the delegates proceeded to the White House, where they were received by President Woodrow Wilson, whose cousin, John A. Wilson, of Franklin, Pa., is first vice-president of the A. A. A.

Resuming the session after the White House call, the delegates heard Congressman Shackelford denounce motorists as "highbrows who want a speedway for motorists, but who never contribute to the building of practical roads." He aroused much opposition and was repeatedly interrupted with questions, when he declared that the only way to build good roads for the benefit of the country was to make

them radiate from the railroad terminals to the rural districts, so "that 'Rube' can get his produce to the markets by the cheapest possible route that you 'highbrows' may enjoy cheaper living. Every time there has been a meeting of a good roads association under the auspices of the motorists they have condemned us as mud-road statesmen and 'pork-barrel' congressmen. It is a fight between the farmers of the country and the motorists."

Congressman Shackelford was in hot water throughout his argument and vigorous exceptions were taken to his remarks by a number of delegates. Representative W. B. Francis, of Ohio, picked many flaws in Shackelford's speech during the course of his address in advocacy of a national system of highways as outlined by the A. A. A.

## Prominent Men Talk

Henry W. Anderson, of Richmond, and Philip T. Colgrove, president of the Michigan State Good Roads Association, also delivered addresses advocating government aid. Charles T. Terry, chairman of the legislative board of the A. A. A., gave a masterly talk on the subject.

C. S. Stetson, of the National Grange, declared that the way to develop a system of roads in this country is to "take into consideration the improvement of the roads over which the farm produce actually travels in getting to market." The evening session was devoted to brief talks from various delegates, followed by illustrated lectures given by Warden Thomas J. Tynan, of the Colorado state penitentiary, who showed how convicts could be used to advantage in good roads building, and O. K. Parker, whose views illustrated motor car routes in southern California.

The feature of the second day's sessions was the discussion of the proposed interstate roads which are under consideration in various parts of the country. The speakers were:

National Old Trails Ocean-to-Ocean road, Judge J. M. Lowe, president, Kansas City; Quebec-Miami International road, Howard B. Hadley, president; Plattsburg, N. Y.; Lakes-to-Gulf road, Pendleton Beckley, Louisville, Ky.; Meridian road, S. H. Lea, Pierre, S. D.; Pacific highway, W. L. Hughson, San Francisco; Southern Transcontinental Highway, D. M. Potter, Clifton, Ariz.; Memphis-to-Bristol highway, C. C. Gilbert, Nashville; Omaha-Denver Good Roads Association, G. E. Parlosce, Minden, Neb.; Platte Valley Transcontinental road, E. C. Ochler, Kearney, Neb.; Iowa River-to-River road, R. N. Carson, Iowa City; Crest of the Blue Ridge highway, Joseph Hyde Pratt, Chapel Hill, N. C.; Park-to-Park road, Senator James Brady, Idaho; Cross Missouri highway, Judge C. C. Gilbert, Kansas City.

A general discussion followed, in which many delegates participated. After this the report of the resolutions committee was adopted and the convention adjourned.

**NEW YORK OFFICE**  
239 West 39th Street

# MOTOR AGE

Published Weekly by  
**THE CLASS JOURNAL COMPANY**  
910 SOUTH MICHIGAN AVENUE CHICAGO

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

**SUBSCRIPTION RATES**  
United States and Mexico  
\$3.00 per Year  
Other Countries including  
Canada \$5.00

## Standardizing Baedeker

*Resolved: First—That the system of road measurement by means of milestones should be remodeled as soon as possible and standardized for each country.*

*Resolved: Second—That this remodeling should be based on the principle of connecting the great centers.*

*Resolved: Third—That the roads radiating from these great centers should be marked with distance posts on which the mileage indication starts from these centers.*

*Resolved: Fourth—That a standard post should be used with a minimum of very legible lettering, and that any official notices should be inscribed as small as possible upon the sign post so as to leave as much space as possible for indicating the direction.*

THESE resolutions, passed at the sessions of the first international road congress held in Paris, France, 5 years ago, could be incorporated to advantage in the minutes of not a few of the special highway organizations throughout America that now are constructing special highways across states, across the country or connecting various parts of the country together.

TOO many of these new energetic organizations are working in too isolated a fashion, laws unto themselves so far as road signs and mileposts are concerned. They do the work as if they, who live along the highways, were the only ones who are to make use of the signs, whereas the signs primarily should be intended for the distant motorist, he who lives in a state perhaps 500 miles distant and who is entirely unfamiliar with the roads, the cities and perhaps the physical characteristics of the country. The signboards across Iowa should be intended as much for the motorist of Illinois, Ohio, Pennsylvania and New York as for the Iowan, because with the motor car an interstate means of transportation, it is for his use that these great trans-state highways have been laid out; then why mark these highways in a local manner, a manner different in every state? It is wrong, it is in opposition to the basic spirit of motoring and the motor car.

THERE must be uniformity in sign posts. Each state or each highway association must not be a law unto itself. Take a lesson from Europe: Before the advent of the international motor car, each country had its own system of milestones, positioned alongside the road for horse service. When the car came the shortcomings of the system appeared. First it became apparent that some uniformity among the various countries was needed. In horse days it did not make any difference; the coming of the motor altered the aspect of affairs. No longer could Germany use one method, France another, Italy a third, Switzerland a fourth and Great Britain a fifth. The motor car goes through half a dozen countries on a single trip, within a single month, and there must be uniformity. Personal safety demanded it. So in America: The motorists can go through three or four states in a single day in New England. Then why be burdened with familiarizing himself or herself with as many systems of road markings, as many different types of danger signs, as many different styles of railroad-crossing signs, as many steep-hill signs, or as many dangerous-curve signs? It is all wrong. Uniformity is needed, and uniformity must be the goal.

THE fact that signboards existed before the day of the motor car is not any reason

why our present day style of board should follow the fashion set in horse days. France has discovered that its old milestone system is not in conformity with the needs of today. It has discovered, and discovered it more than 6 years ago, that the milestone, owing to its position away from the road and its small size, does not lend itself to lettering which can be read from a distance as required by the traveler in a motor car traveling at the legal limit of speed.

BUT France has made many other discoveries. Its motorists have realized the necessity for a "common point of departure in each town and for all roads." The motorist travels by his odometer. He sets it at zero leaving the city and checks it at every important turn or landmark. In horse days such was not necessary and so today there is the necessity for some common point of departure from which all measurements on roads radiating in all directions should begin. In Chicago the corner of Michigan avenue and Jackson boulevards is this logical center. It should be marked by a suitable post. In New York Columbus circle is the natural center from which to start.

SIX years ago Europe saw the necessity of having a post at the entrance to the town carrying the name of the place. Some of the more energetic motor clubs in America have begun such a method of city, town and village marking. It should be carried much further. There is not any reason why road associations could not agree on a common form of nameplate for such purposes. All that is needed is "The Corporate Village of Smithzen," or some similar form. It should be mounted conspicuously at the right side of the highway and the citizens of such places should be sufficiently enterprising to see that a street light is so located as to properly illumine it at night.

There should be one of such at the entrance of each trunk highway entering each center.

THE illumined danger post must come. Where the concealed railroad crossing is, where the steep hill with its dangerous curves does not give an iota of warning, where the dangerous cross road hidden by trees is found, the sign should have a small red electric light or other method of illuminating. It is just as insane today to leave these death pitfalls unmarked at night as to leave the shoals in a water channel without its lights by night or leave the hidden rock in darkness. This is the twentieth century. Motor cars will be used more by night than ever before, and the motorist has every right to adequate protection against dangerous road conditions such as these. It is time motoring organizations and others realize this.







### Signboard Reform Needed

A GLANCE at the accompanying illustrations will give an idea of the need of standardizing the signboards which have been erected in this country for the guidance of motor tourists. Clubs have been working for the common good, but it is apparent that some master hand should take hold of the situation and endeavor to bring order out of the American chaos by gradually bringing about a system of uniform guide posts.

Fig. 1 shows the signboard with which the B. F. Goodrich Co. has marked many miles of American highway. Fig. 2 is a sign that is found around Boston, while Fig. 3 was photographed near Albany, N. Y. It is confusing because of the multiplicity of labels on the one post. Fig. 4 is a plain directing arrow on the Toledo-Detroit road. Fig. 5 is another Massachusetts sign, while Fig. 6, from Pennsylvania, looks decidedly home-made. Fig. 7 is a United States forest service sign found in Southern California. The Chicago Motor Club's neat iron sign can be seen in Fig. 8. The Automobile Club of America's standard sign is shown in Fig. 9, while the painted board of the Hoosier Motor Club, easily read, is shown in Fig. 10. Danville, N. Y., is represented in Fig. 11, while Fig. 12 shows the sign which the Omaha Motor Club is posting. Fig. 13 shows a method of marking turns used in a California city. Fig. 14 is an illustration of the placards found on the River-to-River road in Iowa. Fig. 15 are Pennsylvania signs. Fig. 16 is a perforated iron sign found in New Hampshire, while Fig. 17 is a far-west sign, discovered by E. L. Ferguson while piloting the Aleo truck on its transcontinental journey.



# New England Eclipses Its Former Shows



GENERAL VIEW OF MECHANIC'S HALL, IN WHICH BOSTON SHOW IS BEING HELD

**B**OSTON, Mass., March 11—The biggest and most elaborate motor car show commenced Saturday night when the doors of Mechanic's hall were thrown open to the public. Eclipsing both New York and Chicago in the number of passenger cars exhibited, the Boston show offers the products of 103 makers, while Chicago listed only ninety-nine exhibitors and New York eighty-eight. More than 400 passenger cars and chassis and 1,116 motoring sundries, the products of 232 accessory makers, are distributed over the 105,000 feet of floor surface of the hall, as against the 205 accessory exhibits in Chicago's Coliseum and the 340 at New York. In cars and chassis exhibited at Boston, this year's show is 50 per cent larger than last year's.

## Display of Accessories

Formerly the Boston show was considered the big accessory exhibition of the year, but no longer holds sway in this respect. New York, with its multitude of small accessory plants scattered about the metropolitan district, exceeds it in this respect. As for a passenger car show, the status is different. Boston exceeds both New York and Chicago in the number of exhibits.

In total car and accessory exhibits New York ranks first this year with 467, Bos-

**Editor's Note.**—A description of accessories exhibited at Boston but which were not shown at New York or Chicago will be found on pages 26-29 in this issue.

ton second with 345 and Chicago third with 304.

## Feeling the Public Pulse

The indications for 1913, judging by the business of the Boston show, will be much better than the preceding year, according to the men who have been identified with the Boston show. They base this on the general increased interest in the show this year. To test the matter some of the leaders and leading dealers did not put in any chassis this year in order that the crowds that hang about them might not interfere with prospective customers. These dealers say that it was a good move, for their spaces were crowded as usual but by a lot of people who were real buyers and to whom a chassis display was not a novelty.

Then there are a great many more dealers from New England at the show. Manager Chester I. Campbell said that last year a little more than 3,000 men identified with the industry were registered. With the show but 2 days old this number had been increased by nearly 300. This many outside dealers do not register

until the middle of the week to stay to the finish, so many more are coming.

As a selling show the dealers are well satisfied. They have booked many orders and closed up a lot of customers who were waiting for show time to make a decision. Men with new cars are getting a share of the business, they being able to promise some early deliveries. So the show is a success from all standpoints and will be continued year after year.

## Dealers Flock to Hub

Boston is the big dealers' show of the year. They come from all New England and the southern border of Canada to close agencies, make arrangements for the approaching season and to confer with the Boston office, which, in most instances, is the central distributing point for this section. The dealer's territory covered by the Boston show extends as far south as Bridgeport, Conn., north to the Canadian border and west to Pittsfield, Mass. Practically every dealer in this territory is represented at the show by one or more members of his selling organization. Advantage is taken of this time to hold conferences and the hotels in Back Bay, Boston, are thronged with visiting members of the motor and allied trades.

Mechanic's hall does not lend itself readily to decorative effects, but this year the



ANOTHER VIEW OF NEW ENGLAND'S ELEVENTH ANNUAL SHOW

committee has outdone itself. At a cost of \$45,000, the interior of the historic building has been transformed into a huge garden. Grand hall, the main section of the building, forms the center of the decorative scheme. The motive of this section represents the hanging gardens of Babylon. The decorations are indeed a feature of the show.

The Babylonian king in order to satisfy the yearnings of his bride, a Medean princess, for the luxuriant gardens of her youth, transformed the barren wastes about the palace into a scene of tropic splendor. The main floor scene represents one of these gardens. An array of Bermuda palm trees, 25 feet in height, borders the center space, while from the terraces of the hanging gardens illuminated waterfalls give a striking effect. At each end of the hall is a huge scenic painting. At the north end is the entrance to the palace, Nebuchanezzar's tribute to his Medean bride, painted by Walter Burgrage. In the center of this garden an electric cascade lends an intensely realistic effect to the work.

#### Show Decorations

The remainder of the building has been decorated on the scheme of the gardens 100 years ago. Colonial pillars, from which hang festoons of garlands and electric lights. The idea of separating the exhib-

itors throughout these spaces by the white picket fences, so common in colonial times, is in tasteful keeping with the general outdoor scheme.

#### Big Crowd First Night

More than 30,000 people saw the show Saturday night. The total attendance last year was 227,108; at the 1911 show it was 146,343. It is probable that last year's figures will be exceeded. Last year every car on the floor of the hall was sold at the exhibition.

According to figures compiled by the management of the show, 1,498 cars were sold as a direct result of the 1912 display.

Chester I. Campbell, show manager, sent out over 3,000 letters to dealers, inviting them to attend. Practically every dealer in the territory will respond. With few exceptions these dealers bring prospects with them. Many have been invited to the show by the dealers themselves. The business predictions throughout the show are extremely optimistic. Last year fully 3,000 dealers, who were not exhibitors, saw the show, and it is estimated that this year the number will be increased by 30 per cent.

The growth of the Boston shows, of which this is the twelfth, is of great interest, and the following table shows the increase in attendance since the first was held in 1902:

Year.	Attendance.	Year.	Attendance.
1902	17,350	1908	69,371
1903	30,000	1909	91,007
1905	47,000	1910	107,000
1906	51,000	1911	146,343
1907	56,260	1912	227,108

The possibilities of New England as a motor field are vast. With its large, prosperous population the passenger car finds a ready sale throughout the entire territory. The roads in most of the states, where the natural difficulties due to mountainous country are not too great, are excellent.

#### New England's Strength

There are at present 94,334 motor cars registered in the six states of New England. With its enormous population and with the number of large cities that are included in this section of the union this does not represent half of what there will be eventually. Within the next 2 years the dealers will find that New England will purchase thousands of cars. The prosperity of the country and its accessibility will render it remarkably responsive to the vigorous campaign that the dealers of this section of the country are only beginning to wage. Massachusetts, including as it does, Boston and other large centers, has the largest registration in New England. The others follow in the order named.

State.	Registra- tions.	State.	Registra- tions.
Massachusetts	51,229	New Hampshire	5,764
Connecticut	17,950	Vermont	4,183
Maine	7,743		
Rhode Island	7,565	Total	94,334



## Blow for Truck Shows N. A. A. M. Goes on Record as Opposing Future Exhibitions

NEW YORK, March 7—Continuance of the national New York motor car show and the Chicago show was assured by the action taken by the executive committee of the National Association of Automobile Manufacturers at its regular meeting yesterday. On account of the agitation in some quarters for the abandonment of the national shows, their future was doubtful. However, the committee confirmed its own action taken in February in determining to conduct a show of passenger vehicles in 1914, but placed itself on record as opposing the continuance of commercial vehicle shows. This probably makes the New York show almost certain, but means that the truck exhibitions which have formed part II of both the Chicago and New York affairs no longer will be held in connection with the passenger-car functions. The subject will be investigated further by the committee before definite action is taken.

It is probable that there will not be a special motor car building at the Panama-Pacific exposition, for it was announced at this meeting that manufacturers failed to respond in sufficient force to the proposition to erect a special building. It was decided to abandon the plan and accept the 60,000 feet offered in the Transportation building.

Action on the fuel question was taken when it was decided to request the Society of Automobile Engineers to appoint a committee to cooperate with the engineers of the oil producers in the investigation of fuels and carbureters. The committee on good roads announced its approval of the ocean-to-ocean highway plan. The Electric Vehicle Association was granted an addition to the space occupied this year at the Chicago show.

Arrangement for the consolidation of the N. A. A. M. and the Automobile Board of Trade have so far progressed that the plans probably will be consummated in the near future.

### HAWKEYES BUY BY CARLOADS

Des Moines, Ia., March 8—Forty thousand people saw the fourth annual show of the Des Moines Automobile Association, which closed at the Coliseum tonight. It was primarily a selling show and 1,500 dealers from Iowa and northern Missouri were here during the week.

Most of the business was in carload lots to dealers, but every local dealer reported a number of retail sales each day. Managers and exhibitors were enthusiastic over the business done and say that it forecasts the greatest year in the history of the motor car business for Iowa dealers.

A consensus of opinion among the dealers was that not fewer than 20,000 cars would be sold in the state this season. There was a noticeable tendency at this

year's show toward the moderate and higher-priced cars. One low-priced car is holding its own, but the general tendency seems to be toward the cars from \$1,000 up to \$1,750. A number of high-priced cars were sold during the show.

The Coliseum was transformed into a miniature Dutch village, with windmills and electrolitied streets. Thousands of incandescent lights were used. Sixty different makes of cars were shown with a total of 200 models.

### GOOD BUSINESS AT PITTSBURGH

Pittsburgh, Pa., March 6—The third annual show of the Pittsburgh Automobile Association opened Saturday evening, March 1. The gate receipts that night were 80 per cent ahead of the opening night last year. This proportionate gain has been well maintained throughout the week. The show place is on the downtown loop and has a floor space of 75,000 square feet. Nearly 15,000 people attended the show Wednesday afternoon and evening.

## South Ripe for Motor Cars Business Done at Louisville Show Tells Makers of Possibilities

Louisville, Ky., March 8—After having held attention since Wednesday evening, in the First Regiment armory, which covers 54,000 square feet of floor space, what is believed to be the best business show ever held south of the Ohio river closed tonight.

Following the close of the show, one of the officers of the Louisville Automobile Dealers' Association, under whose auspices the exhibition was held, gave out the following statement regarding the amount of business transacted during the show:

"The total number of cars sold at retail was ninety-one. Besides these outright sales about fifty cars were contracted for at wholesale prices by appointed agents. Car sales totaled \$140,000 and sales of accessories, exclusive of wholesale contracts, but including motorcycles, reached \$20,000, making \$160,000 total."

Despite 2 days of adverse weather conditions, a steady stream of visitors flowed through the doors of the armory. It is estimated that 30,000 persons saw the display.

One of the features brought out plainly during the exhibition was the interest taken by the residents of the small towns and country districts. About 150 agents, sub-agents and independent dealers, who live in southern Indiana, Tennessee and Kentucky, attended the show.

Those who are connected with the trade are optimistic and say there is much promise of business in the near future. In all, there were forty exhibitors, twenty-two of which displayed cars, the remainder showing accessories and motorcycles. One hundred and fifty cars, representing thirty-nine different makes, were exhibited. Two Louisville-made trucks were displayed—the Transit and Urban electric.

## Optimistic in Colorado Denver Show Brings Out Trade Prospects in Western Territory

DENVER, COLO., March 7—Denver dealers in motor cars and accessories are unanimous in declaring the outlook highly favorable for a heavy trade in their line this coming season, and their prediction is strengthened by the business indications developing at the twelfth annual motor car show now in progress at the Auditorium. The event will last 1 more day, and it promises to prove profitable to all participating.

"The show is going to be of immense advertising value to exhibitors, and especially to those having something attractive to offer in a new line," said one agent today. "For instance, this truck I am selling never has been exhibited west of Chicago before, and it is gaining a great deal of attention. I already have secured several good prospects from different sections of the state, and even some from neighboring states; and I expect to receive benefits from this exhibit in many months from now."

Similar expressions of gratification are voiced by many of the exhibitors, and a number of sales and good prospects are reported.

Distant parts of Colorado and points over the line in Wyoming, Nebraska, Kansas, New Mexico and Utah, and even as far as Idaho and Montana, are represented in the sales and prospects thus far reported.

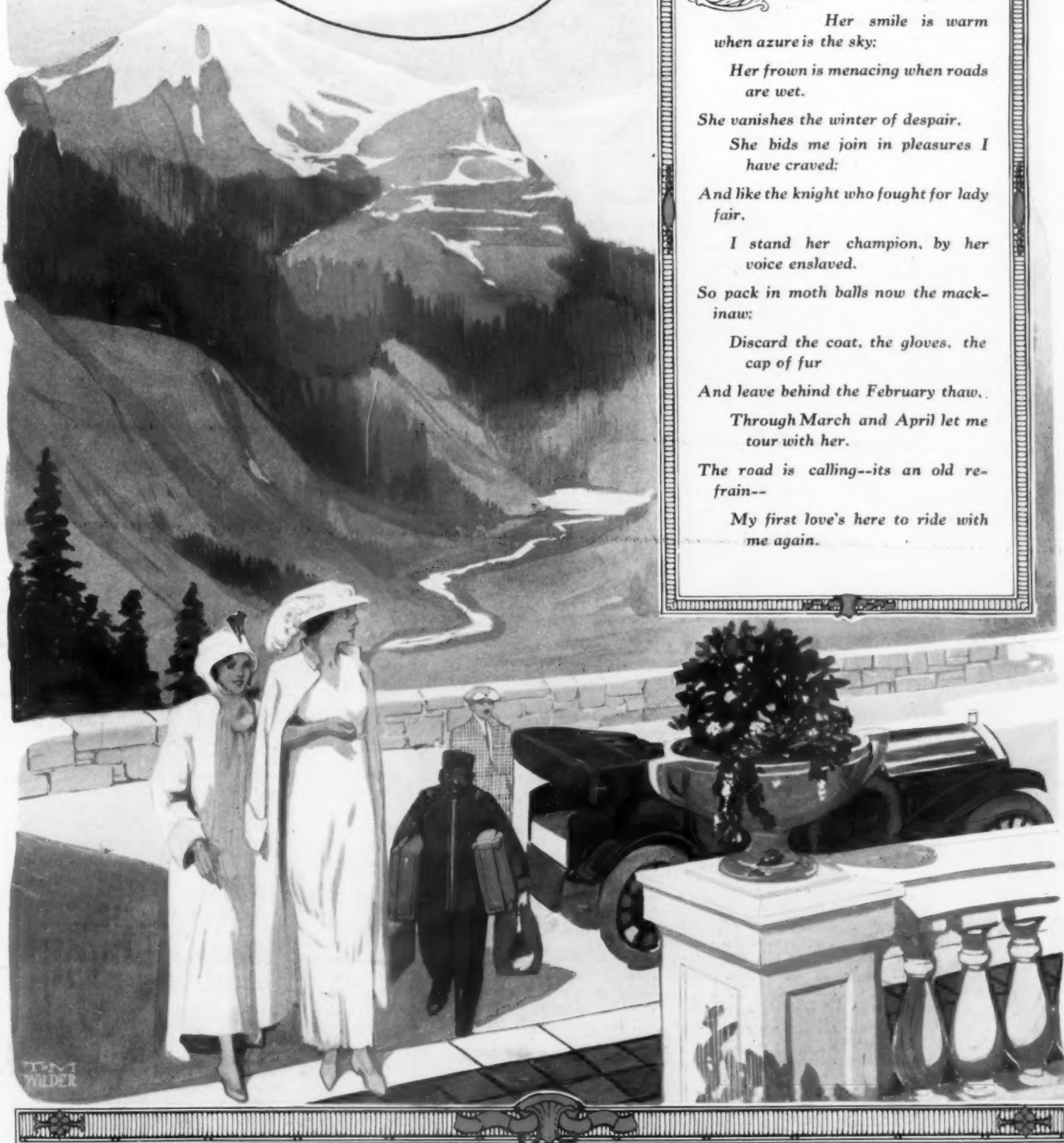
One of the cars exhibited is the first product of a new factory started in this city just a short time ago, and the manufacturers claim that the show has brought them three orders from local parties and one from the southwestern part of the state. This is an electric delivery truck of attractive design.

While the women are especially interested in electric pleasure vehicles and in self-starters, left-hand drive equipment and other factors for making the gasoline cars easier to handle, the commercial cars are receiving their full share of attention. The motor tractor also is creating a great deal of interest among the farmers and ranchmen visiting the show; while the various makes of tires, lighting equipment, horns and other accessories, in attractively decorated booths, are observed in more than a search-for-novelty manner by the Denverites.

The show is considered not only entertaining and educational, but also an event of genuine value as a practical stimulus for business in a wide territory. There are eighty-seven cars exhibited, representing an aggregate value of \$300,000. A special freight train direct from the Omaha show arrived Monday night with the Mitchell, Marion, Case and Selden truck exhibits as they appeared at the Omaha and Chicago shows.



# Routes and Touring Information



**M**

LADY Spring awaits  
with glances shy

To woo me with  
the charms of  
the coquette,—

Her smile is warm  
when azure is the sky;

Her frown is menacing when roads  
are wet.

She vanishes the winter of despair,

She bids me join in pleasures I  
have craved;

And like the knight who fought for lady  
fair,

I stand her champion, by her  
voice enslaved.

So pack in moth balls now the mack-  
inaw;

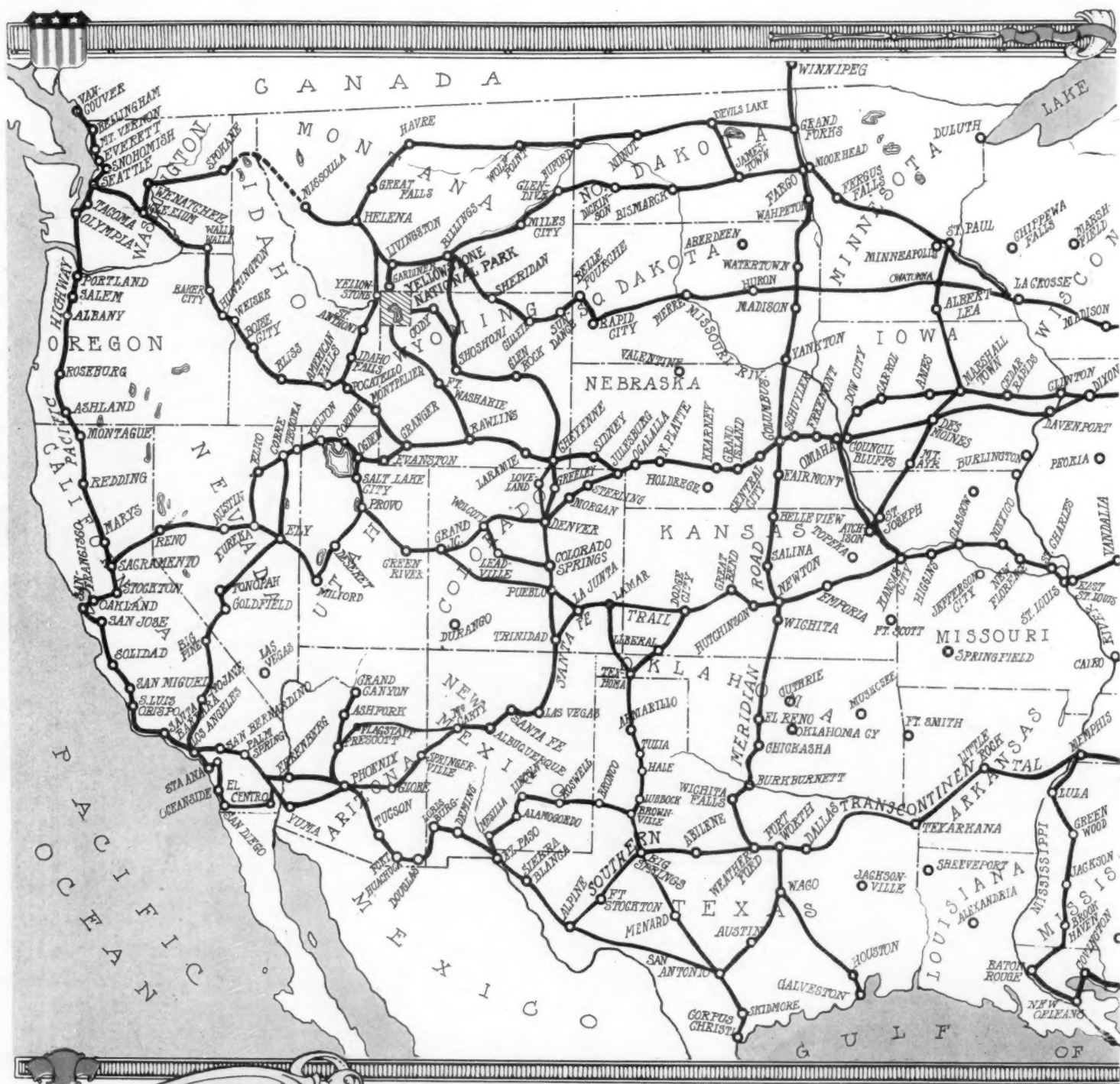
Discard the coat, the gloves, the  
cap of fur

And leave behind the February thaw.

Through March and April let me  
tour with her.

The road is calling--its an old re-  
frain--

My first love's here to ride with  
me again.



THE above map is an illustration of the transcontinental routes of the day with a few digressions from them in order to take in the view points of the country. The most popular through route is by way of Chicago, Omaha and Ogden, a distance of 3,752 miles. The next road to the south paralleling the central route to La Junta, Colo., and then dropping down through New Mexico and across Arizona to Los

Angeles is 3,391 miles. On the southern route the first section to Atlanta is 1,039 miles and Atlanta to Los Angeles is 2,967 miles. The Meridian road from Winnipeg, Can., to Galveston, Tex., is 1,495 miles and the Pacific highway, Tia Juana to Vancouver, B. C., approximately 2,025 miles.

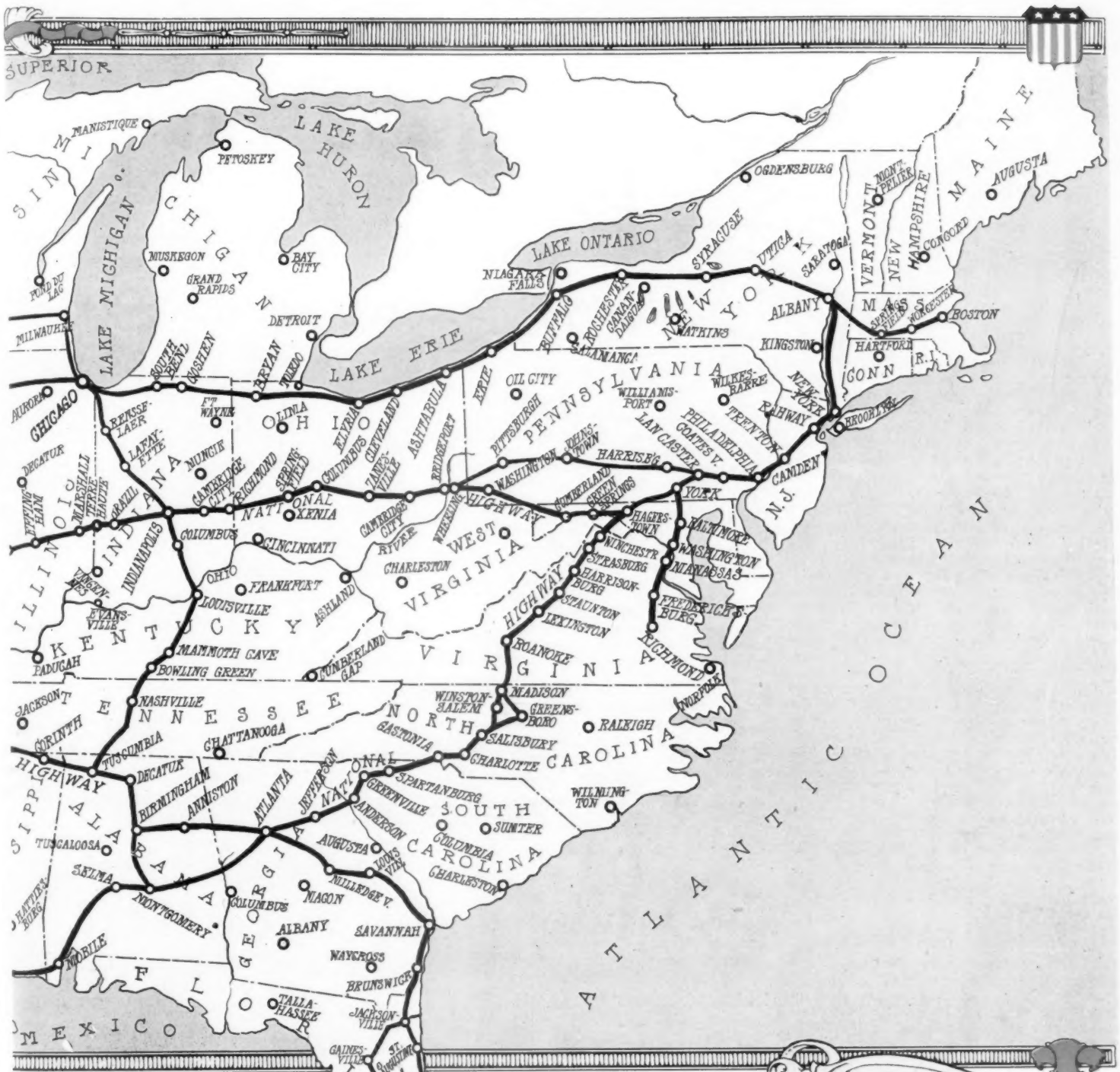
Universally known as the central transcontinental route; by our forefathers as the Oregon trail, Midland trail, and various other designations which still prevail along some sections of this road, it would not be a very broad statement to say that about nine-tenths of the motorists use this pathway in inter-coast travel during the season. In leaving New York the road wends its way in a right-

angle direction out of the state through the larger cities, thence along the shore of Lake Erie to Toledo, across Indiana to Chicago through Illinois and Iowa to Omaha, Neb., along the North Platte river dipping into Colorado to Julesburg and back again through Sidney to Cheyenne, Wyo. About the height of western atmosphere is reached when traveling through Wyoming, Utah and Nevada and after leaving Reno, the city of divorces, the Sierra mountains are soon crossed and the good, hard roads of California welcomed the rest of the way to the coast.

A second transcontinental trail is the National highway beginning at New York and passing through Philadelphia, Hagerstown,







Cumberland, Indianapolis, St. Louis, merging into the Santa Fe trail at Kansas City, following through Newton, Great Bend, Dodge City, La Junta, Las Vegas and Albuquerque, meeting the southern transcontinental at Phoenix and winding up at Los Angeles. This is a pike road in the east, and worn so badly in stretches that travel is diverted from it as much as possible. One instance of this is the improved road by way of Harrisburg, Johnstown and Pittsburgh.

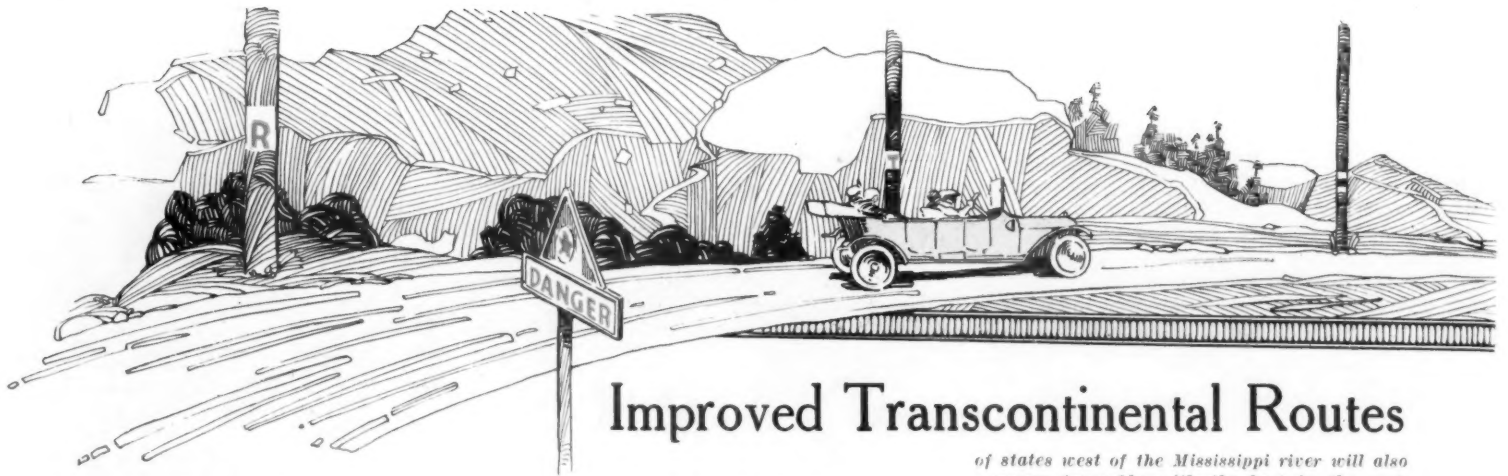
A cut-off road known as the Borderland trail has become quite prominent of late. It extends from Dodge City, Kans., on the Santa

Fe, through the Panhandle of Oklahoma to Amarillo, through the eastern corner of New Mexico to El Paso, Tex., and on to Lordsburg, N. M., Tucson and Phoenix. It is considered far superior to the more western road running in the same direction.

The Pacific highway through the untiring effort of the California motor clubs and commercial bodies, has improved wonderfully, and with the advanced activity in Oregon and Washington, in the course of time one will be able to go from end to end—Via Juana to Vancouver, B. C.—with little difficulty.

The Meridian road marks an important connection between all the transcontinental highways. It takes its start at Winnipeg, Can., crosses the northern transcontinental at Fargo, N. D., the central route at Columbus, Neb., the Santa Fe at Newton, Kans., and the southern cross road at Fort Worth, Tex., continuing on to the gulf at Galveston, making an interesting route for those who enjoy touring.





## Improved Transcontinental Routes

By John P. Dods

**NINETY-FIVE** per cent of the car owners east of the Mississippi have little or no idea of the enormous changes made in the roads west of the Mississippi in the last 2 years. They have been many, and as a result the season of 1913 opens in a most encouraging manner for those who enjoy touring.

Up to the summer of 1912 it was considered almost an exploring expedition to make the trip from Chicago to San Francisco, but the tremendous strides made in road improvement, especially west of Omaha, have so materially changed the entire situation that the trip from Chicago to Salt Lake City can be made almost as easily as that from Chicago to New York, with the possible additional equipment of 100 feet of good manila rope.

### Experiences of Pioneers

A little reference to the state registration tables brings out the astounding fact that the large majority of the state leaders in car owners per capita are west of the Mississippi. This great increase has occurred in the last 2 or 3 years, and it is only natural that with such a large percentage of the population owning machines they have been a power in the furtherance of the good roads movement as it is an absolute necessity to them.

Although most of the northern states east of the Mississippi probably have spent more actual money in the improvement of their roads during this period, the relative improvement in that time cannot be compared with the vast country west of Illinois.

Travel from many points on the Atlantic coast north of Virginia to Mississippi river points has not been a very difficult matter over the main lines for 7 or 8 years. Furthermore, these main lines have not changed materially in that time; that is, in the towns passed through. West of the Mississippi, however, it is an entirely different situation.

### Early Days of Touring

Prior to 1910 it was considered quite a trip from Chicago to Omaha or Kansas City and the people who made a trip as far west as Colorado were few and far between. Those who were venturesome enough to attempt the trip from coast to coast were counted real explorers and the story of their travels nearly always appeared in some publication. The stories of these journeys really were worthy of the space devoted to them, for the good roads movement had not taken effect and west of Omaha and Kansas City there probably were not 100 miles of graded road and but few bridges outside of the city limits until reaching California.

Now that the good roads movement has been in full swing for 2 or 3 years the changes in the western states are unbelievable by those who have not been conversant with the situation during that time. Although the easterners are spending enormous amounts of money to make improved roads the conditions over the main highways from New York and Phila-

delphia to Chicago or St. Louis have not so materially changed since 1910.

For the westerner it is impossible to consider building anything in the shape of a permanent road in the sense of macadam or brick. In these states, however, the people are quicker to take up improvement work than the easterner. This is especially true of the good roads movement, because it so materially affects almost every property owner where 80 per cent of the motor cars are owned outside of the city limits.

Although it has been impossible as yet to build but a few miles of hard road, they have, by grading and dragging their natural dirt, sometimes mixing the sand and clay, made highways that under ordinary weather conditions during 4 to 6 months of the year, compare favorably with the best of roads in the east. In the mountain states where rock and gravel are more plentiful they are placing it on the highways in large quantities and there can be no doubt that in the course of 4 or 5 years the trunk-line routes in a large number

of states west of the Mississippi river will also compare favorably with the best in the east.

Another thing that has made equal progress with the good roads improvement west of the Mississippi are the hotel and garage accommodations. The few people who made the trip from Chicago to San Francisco 4 and 5 years ago carried camping equipment which they used most of the time west of Omaha. This summer it will not only be possible, but almost as practical as on the first leg of the journey from New York to Omaha, to get good hotel and garage accommodations at every noon and night stop from Omaha to Frisco.

### Hotels Have Been Improved.

In many instances hotels seem to have been built to take care of the enormous increase in tourist travel and of course the betterment of garage facilities is directly due to the increased number of machines in all localities. To get a real adequate idea of what this increase in travel has been the reader must realize that up to the summer of 1912 a transcontinental tourist passing through Cheyenne, Denver or Santa Fe was quite a curiosity even in those cities, but during only 3 months of last summer the secretary of the good roads

## Motor Age's 1913 Program

**TWO** years have elapsed since Motor Age inaugurated the Routes and Touring Information department for the purpose of giving every assistance possible to its readers in planning motor car trips. For the season of 1911 upwards of 200 inquiries were handled in this department, to say nothing of the personal letters which required attention along this line. Publication of information during the winter months was abandoned and the 1912 services of the department offered in the announcement the last of February.

A resume of that year's work shows just double the number of communications handled; road reports from the Blue Book and Touring Club of America were added; actual accounts of trips taken by motorists furnished with itineraries by Motor Age were sent in and published, and attractively illustrated; many interesting trips and circle tours from the larger cities were suggested; and a number of articles were published on camping trips which forcibly brought out the cheapness of this entirely satisfactory mode of travel.

Lengthy articles on Florida touring written by Asa Paine, Edwin D. Lambert, J. H. Reese; on North Carolina by J. Hampton Rich; on Salt Lake City to the coast by W. M. Bransford, former mayor of that city; "One Thousand Miles through Colorado," by J. P. Dods, published in four parts; foreign tours in Jamaica, Guatemala, Japan and India; all these have been written by prominent men in the motor industry and published during the year.

For 1913 it is the aim of Motor Age to again double the serviceability of the department, continuing the methods of the previous year, but strengthening it with descriptions of articles for use in long distance travel. The

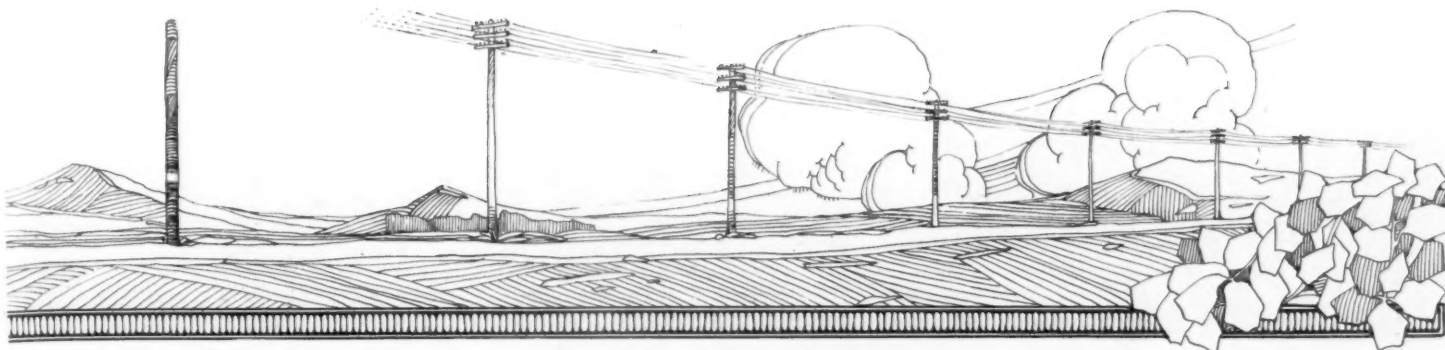
sight-seeing points of the larger cities will be brought out so that the motorists will be sure and get every possible benefit from their trips. More maps of popular roads through the country will be utilized, also plans of the larger city streets will be given.

There will be articles on transcontinental touring. J. M. Murdock, one of the best authorities on long distance motoring, has written a very lengthy and excellent article on his trip; also A. N. Mead has contributed an article on his tour from coast to coast, with an exceptionally fine lot of photographs accompanying it. Tours in Porto Rico will be outlined; Nova Scotia will be exploited in a well-written article by Estelle Harrower, with a most excellent series of photographs ever procured in that country for illustrations. A tour of the missions, a trip from San Antonio, Tex., to San Francisco, Cal., taking up each mission on the way with a condensed history of each is expected. A series of articles on the old trails is in course of preparation.

In writing for information, Motor Age subscribers should use but one side of the paper, state their wants clearly and concisely and attach their signatures and addresses legibly. Any one not desiring his or her name attached to the communication as it is published in Motor Age, may use a nom de plume; but in no case will attention be given the request unless it is properly signed.

Readers of Motor Age making tours through different parts of the country are requested to submit stories of their trips, accompanied by photographs taken en route, which may be used in illustrating the article.

A word of thanks is given to the many who have lent their efforts during the past year in exploiting their sections of the country.



## Now Are Good Motoring Highways

organization at Cheyenne reported that more than 600 different parties registered for noon or night stop in that city. Salt Lake City reported about the same number, and although there is no such accurate count obtainable along the southern route, it is safe to say that an equal number of people made the trip across Arizona and New Mexico some time during 1912.

### The Overland Trail

In considering the routes to follow on transcontinental trips there is one route that seems to stand out above all others at this writing. This has become generally known as the Overland trail or the Central route. Of course there are many short options, but on the whole it follows the course as first taken by the railroads from New York, through Albany, Buffalo and Cleveland to Chicago. It seems safe to say that over 90 per cent of the transcontinental parties starting from the Atlantic coast use part or all of this route.

The only other important line east from New York is the one by way of Philadelphia and Pittsburgh through Columbus and Indianapolis. Of course some of this travel goes to St. Louis, but due to the rather poor condition

of the road from Terre Haute to St. Louis and Kansas City a large majority of the travel is crossing Illinois west from Chicago. The good roads movement, however, has at last taken a firm hold in Illinois and Missouri and it is only fair to state that in the course of 2 or 3 years this slightly more southern route will be a very important connection for transcontinental travel.

Crossing Iowa almost the same situation holds true, for although there are as many as seven parallel cross-state routes, the majority of the travel follows one of two lines between Clinton or Davenport and Omaha. From Omaha west the Overland trail is even more clearly defined, following the Platte valley and Union Pacific practically all the way through Ogden and Salt Lake City. At this point there has been considerable rivalry between the south route around Great Salt Lake and the north route.

### After a Southern Connection

Up to this time by far the larger part of the travel has followed the older and better known north route. Salt Lake City is working very hard for the southern connection and it is difficult to tell at this time which will be

the accepted road for permanent improvement, although both of them have undergone material changes in the past 2 or 3 years.

From Ely to Eureka west the route is well defined through Reno and Truckee to Sacramento and San Francisco. Those familiar with the building of the early railroads will recognize that this is not only the first and best-known transcontinental route, but also is along the line of the first complete transcontinental railroad and the same factors that made the railroad follow this line are true for highway construction.

Nevertheless, the motor car owner does not always look at the long level stretches as the most attractive and it is only fair to state that the Midland trail across Colorado and Utah through Grand Junction surely will be an important factor between Julesburg and Salt Lake City. The very reasons that made this link in the transcontinental system at first difficult on account of crossing the Rocky mountains at their highest point is in itself sufficient to recommend it as one of the most scenic routes in the world. The Colorado portion is open for tourist travel now and the Utah end probably will be before the latter part of this summer.

The next most important transcontinental line is generally known as the Southern route and because of road conditions previously mentioned a large percentage of the travel over this route is across northern Illinois and Iowa and then south to Kansas City, following from this latter point what is known as the New Santa Fe trail to Pueblo, then south and west through Santa Fe and Phoenix, crossing the Colorado river at Yuma and on to San Diego or Los Angeles.

The most serious difficulty on this route has been the 500-mile stretch between Albuquerque and Phoenix, as the only towns of any consequence on this long stretch are Springerville and Globe. Considerable publicity has been given to the route as a part of the organization known as the Ocean-to-Ocean highway, but from the best information obtainable very little seems to make this section more acceptable to real tourist travel. One improvement of vast importance is the building of a modern bridge across the Colorado river at Yuma, and it is expected this work will be completed not later than the fall of this year.

### Avoiding the Desert

In order to avoid the desert country between Albuquerque and Phoenix there has been organized what is known as the Borderland route, which leaves the new Santa Fe trail at Dodge City, going south into the Panhandle of Texas through Amarillo and Plainview, thence to Roswell, N. M., and from there west through Deming and Tucson to Phoenix. Another connection worthy of consideration is from Santa Fe to Roswell, thence over the Borderland route to Phoenix.

There is one reason why the southern route situation should be considered as really independent of all more northern routes, and this is on account of its being open for travel nearly 12 months in the year and especially in the late fall and winter, when it would be absolutely impossible to cross the mountains to the north on account of the snow.

## Uncle Sam's Road Investments

THAT Uncle Sam is at last aroused to the need of improving his highways is certain. It did not require the federal aid convention at Washington last week to convince his nephews and nieces of this fact—facts and figures tell them this without fear of contradiction. Everywhere there is activity, and even road-poor Illinois is aroused, and residents of the state are making every effort to "pull Illinois out of the mud."

An idea of the activity which is being displayed by the various states in the union is had from statistics compiled which show that in 1912 twenty-eight of the states spent \$22,581,910 on road improvement. Returns from twenty-six states report 1,363,711 miles of roads. Twenty-three states have 21,032 miles of improved highways.

New York, for instance, is credited with 80,000 miles of roads, of which 11,052 are improved. There are 7,092 miles of macadam roads and 8,500 miles of stone roads in the state. In 1912 New York built 662 miles of new roads and improved 11,052, spending \$14,915,141. Massachusetts, with 23,000 miles of highways, has 20,700 miles improved, probably the best showing of any of the states in the union. The Bay state is credited with having spent \$500,000 on its highways last year. Iowa is frenzied with good roads enthusiasm, and last year paid out \$7,000,000 for highway improvement. The Hawkeye state has 107,000 miles of roads of which 2,500 is improved. It has 100,000 miles of dirt roads, 2,500 miles of stone and 4,500 of macadam. Kansas also is showing commendable activity, having spent nearly \$5,000,000 in 1912. Of its 98,000 miles of roads, all but 1,000 are made of dirt. In 1912, 10,000 miles of these roads were improved and 60 miles of new

highways constructed. Wisconsin with 65,000 miles of roads has improved 12,000 miles of them. In 1912, 500 miles of new roads were built and the cost of highway improvement in the Badger state was \$1,250,000.

Illinois is credited with having spent \$7,500,000 in 1912, but if this has been done residents of the state have not yet been aroused to the fact. Illinois has 100,000 miles of roads of which 10,000 are improved. Last year 61 miles of experimental roads were constructed. Mississippi spent \$3,500,000 and Missouri \$3,000,000. The former has 44,000,072 miles of roads and in 1912 built 333 miles of new thoroughfares. Missouri has 108,000 miles of roads, of which 4,750 are improved. Michigan with 70,000 miles of roads only has 1,500 improved. Most of the thoroughfares are of dirt, and in 1912 240 miles of new roads were built. Only \$125,000 was spent by the Wolverines.

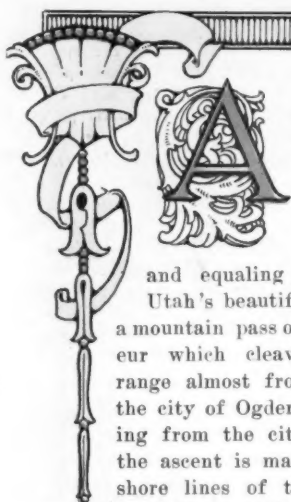
Statistics regarding the other states also are interesting. North Dakota has 64,784 miles of roads and spent \$700,000 in 1912; the District of Columbia has only 472 miles of roads, and spent \$223,000 last year. Utah has 39,953 miles of roads and its 1912 expenditures amounted to \$570,000. Montana has 33,500 miles of roads, and last year spent \$750,000; North Carolina has 48,235 miles of roads and spent \$1,569,140 in 1912; Connecticut has 12,583 miles of roads and last year spent \$1,500,000; Colorado has 34,000 miles of roads and spent \$1,900,000 last year; New Jersey with 15,000 miles does not report its expenditures; Pennsylvania spent \$4,000,000 last year and has 86,696 miles of road; Washington has 39,062 miles of road and spent \$5,000,000 last year; South Dakota has 65,000 miles of roads and spent \$250,000.



## Ogden Canyon Attractive to Motorists



PIONEER FALLS AT OGDEN, WATER DROPPING 440 FEET FROM POWER COMPANY'S PIPE LINE



As a side trip for a transcontinental tourist there is nothing so easily accessible from a great city and equaling in magnificence, Utah's beautiful Ogden canyon, a mountain pass of unrivaled grandeur which cleaves the Wasatch range almost from the center of the city of Ogden, Utah. In passing from the city to the canyon the ascent is made to one of the shore lines of the ancient Lake Bonneville which, in pre-historic times, filled the valley now occupied by Ogden, Salt Lake City and Great Salt lake.

From this point a beautiful panorama is unrolled to the view. Below is the city with its buildings, its steeples and the smoke from its factories. To the north is a great power plant driven by water from Ogden river. In the distance is the shimmer of Great Salt lake with the mountains beyond and with Fremont and Antelope islands lifting their rugged forms from the surface of this dead sea of America.

The broad delta formed under the waters of the ancient lake by material brought down by Ogden and Weber rivers now stretches out as dry land between the observer and the shores of Great Salt lake. This delta, which was laid bare by the receding waters, is now covered by orchards and farms. The Ogden and Weber rivers, which originally formed this

delta, now furrow its surface with deep channels and join their waters just west of the city, forming a broad V. Each followed up from the point of union leads to a canyon. Through the Weber canyon enters the Union Pacific Railway and the motor road from the east.

About 15 miles above the point of this V the magnificent gorge traversed by Ogden river widens into a mountain valley of some 150 square miles. One of the finest boulevards in the west traverses the entire length of Ogden canyon from the city of Ogden to a village in the mountain valley. This boulevard, hugging the mountain sides along the Ogden river banks as it does is one of the most beautiful motor drives in the west. The road itself is kept in good repair and sprinkled during the summer months. Although winding in and out between crags and around the numerous bends of the river it is of sufficient width for cars to pass at all points.

One of the chief beauties of Ogden canyon is the mountain stream known as Ogden river, unsurpassed in picturesqueness. An artist might find a whole summer's sketching along its banks as it murmurs among the boulders and shoots out from under the dense overhanging foliage.

During the summer season the canyon is used by the residents of Ogden as a city park. In the open places are pleasure resorts or the tented cities of visitors who have flocked from all quarters of the country seeking the cool mountain retreat for hunting, bathing and other outdoor amuse-

ments. Furnished tents and cottages may be rented for a month or a season at reasonable rates. A well-appointed hotel, known as the Hermitage, crowns a cliff overlooking a delightful resort hidden among the trees. Here the best accommodations, accompanied by trout and chicken dinner can be had at no greater cost than is paid for the same accommodations in the city.

If one has no more time at his disposal, a single hour suffices to make a round trip from Ogden to the village of Huntsville in the mountain valley at the upper extremity of Ogden canyon. But by devoting an entire day to the finest piece of scenery from coast to coast one may make stops at the Ogden Canyon Hot Springs; the Hermitage hotel,  $3\frac{1}{2}$  miles from the mouth; Idlewild, 2 miles beyond, and the Oaks, about 9 miles from the city. The resorts at these points are provided with cafes famed for their trout and chicken dinners.

### FROM EDMONTON TO VANCOUVER

Advocating the construction of a scenic highway from Edmonton, Alta., to Vancouver, B. C., by way of the Yellowhead pass through the Canadian Rockies, which would afford connections with a system of roads through western Washington and Oregon and California south to San Diego, William MacAdams, editor and managing director of the Edmonton Capital, says in an interview that the plan is feasible, though it might be looked upon as a large order by those not familiar with the geographical and other conditions.

"It may surprise many people to learn that more than 50 per cent of the road already is completed," Mr. MacAdams explained, "and that a large part of it is used by motorists. With the exception of a piece of road between Tete Juan Cache and Fort George, B. C., there is very little construction that would be difficult, and practically all of it could be brought up to motor standard by a little inexpensive repair work.

"Those who are familiar with the railway construction work that has been in progress the last 4 or 5 years knows that beginning at the Edmonton end there was built, parallel with the Grand Trunk Pacific main line to the Rockies, a tote road, over which contractors freighted their supplies. The trail on the prairie section was mostly a winter road and for that reason it is not now a permanent highway.

"To bring it up to standard would mean the expenditure of a large amount of money. But once the mountain country is reached, the road is of a good character, with easy grade, good bridges and good foundation, extending all the way to the head of navigation on the Fraser river at Tete Juan Cache."



# Answers to Route Inquiries

## SPRINGFIELD, MO.-LOS ANGELES

**D ONIPHAN, MO.**—Editor Motor Age—Please route me from Springfield, Mo., to Los Angeles, via Colorado Springs, Colo., also via El Paso, Tex. Which will be the best route?—W. W. Martin.

With a very little back travel, you can go to El Paso as well as Colorado Springs. In getting to Colorado Springs, you would route first to Wichita, Kans., through Billings, Aurora, Monett, Pierce City, Joplin, Galena, Chepoka, Coffeyville, Cherryvale, Morehead, Thayer, Fredonia, Fall River and Augusta, making a distance of about 260 miles. The fastest road to Dodge City is through Goggard, Garden Plain, Kingman, Cleveland, Cullison, Wellsford, Greenburg and Ford, 180 miles. Taking the Santa Fe trail to Pueblo, you will find it 288 miles, passing through Cimarron, Ingalls, Garden City, Lakin, Kendall, Syracuse, Holly, Granada, Lamar, Prowers, Las Animas, La Junta, Swink, Rocky Ford, famous for its cantaloupes, Manzanola, Orchard Park and Avondale. An hour or so will take you to Colorado Springs through Pinon, Buttes and Fountain.

Not a few authorities on western touring discourage motorists from going through New Mexico mainly because of the lack of hotel accommodations. If a camping outfit is taken along, then nothing is to hinder you, although the condition of the roads is away below the one we are giving you, which is considered the best connection for the southern route. All Texas travel enters Colorado over this route.

You route back over the Santa Fe trail to Lamar, then go through the Panhandle of Oklahoma to Stratford, Tex., where the Borderland route is intersected and followed to Phoenix. This road runs through Ruby, Dumas, Amarillo, Canyon, Happy, Tulla, Plainview, Hale Center, Abernathy, Lubbock, Brownfield, Gomez, Plains, Bronco, Roswell, Hondo, Ruidoso, Alamogordo, to El Paso. An article on this half of the Borderland route appeared in Motor Age issue of December 5, and on the last half to Phoenix, Ariz., in the issue of March 6. You are also referred to the inquiry from Clarksville, Tex.

If you decide not to go to Colorado Springs when you reach Greensburg, route to Bucklin, Minneola and Fowler, striking the Borderland route at that point and continuing through Plains, Liberal, Tyrone, Guymon, Texhoma to Stratford. The 1913 Blue Book 5 will contain the running directions for these roads.

## MADISON, WIS.-FARGO, N. D.

**De Forest, Wis.**—Editor Motor Age—I expect to take a motor trip from Madison, Wis., to Fargo, N. D. Kindly publish the best and shortest route.—S. Farness.

The most traveled road would be that one taking you into Minneapolis, going first to La Crosse, 146 miles, passing through Ashton, Sauk City, Baraboo, the winter quarters of Ringling Brothers; Abelmans, Reedsburg, Laval, Wonegan, Union Center, Elroy, Kendalls, Cashton, Middle Ridge and St. Joseph. The Dells of Wisconsin are reached by going to Kilbourne from Baraboo.

La Crosse to St. Paul, 162 miles, is a mixture of level and rolling stretches in going through La Crescent, Ridgeway, Witoka, Winona, Lewiston, Utica, St. Charles, Eyota, Chester, Rochester, Pine Island, Zumbrota, Wastedo and Cannon Falls. There are only a few stretches of sand and gravel to Alexandria, 140 miles, generally good dirt roads prevailing. You should route through Crystal Lake,

Osseo, Anoka, Elk River, Becker, Cable, St. Cloud, St. Joe, Avon, Albany, Freeport, Melrose and Sauk Center, then to Fargo with the same road conditions continuing 124 miles through Garfield, Evansville, Melby, Ferguson Falls, Rothsay, Barnesville and Moorhead.

There is another route going through the southern portion of Minnesota to Brookings, S. D., thence north over the Meridian road. This is not quite so popular, but outlined in the Blue Book 5, as well as the above.

## CALIFORNIA TEXAS TO

**Clarksville, Tex.**—Editor Motor Age—Please give me a route to Los Angeles and advise the distance.—B. Lennox.

Your first day's journey would be to Dallas, which is 152 miles, and with good luck you might be able to get to Fort Worth, as it is only 33 miles farther. The towns are Detroit, Blossom, Paris, Brookston, Hightown, Petty, Honey Grove, Dodd City, Bonham, Whitewright, Pilot Grove, Sedalia, Anna, Melissa, McKinney, Plano, Richardson, Dallas, Grand Prairie, Arlington, Handley and Ft. Worth.

To Abilene it is 176 miles; to Ft. Stockton, about 260 miles; Sierra Blanca, 222 miles; El Paso, 92 miles; Lordsburg, N. M., 149 miles; Douglas, Ariz., 100 miles; Tucson, 139 miles; Phoenix, 130 miles; Yuma, 207 miles; El Centro, Cal., 102 miles; San Diego, 124 miles, and Los Angeles, 136 miles. The 1913 Blue Book will have running directions over this entire road, but it will not be out before May. There have been numerous changes made over the present edition, which cannot be used between Abilene, Tex., and Tucson, Ariz.

Ft. Worth to Abilene routes through Ben Brook, Aledo, Annetta, Weatherford, Mineral Wells, Palo Pinto, Breckenridge, Albany, Hamby; to Ft. Stockton—Winters, Ballinger, San Angelo, Mertzon, Barnhart, Ozona and Sheffield; to Sierra Blanca—Marathon, Alpine, Marfa, Aragon, Valentine, Wendell, Chispa, Lobo, Dalberg, Torbert, Grayton; to El Paso—Etholen, Lasca, Finley, Ft. Hancock, Fabens. Or leave the railroad at Sierra Blanca for Leneer Brothers ranch, then come back to the railroad at Clint, following the pike from there to El Paso.

You doubtless read the article in the issue of March 6 on the Borderland trail, and if not, it would be advisable to do so. It is 6 hours running time to Lordsburg by way of Canutillo, Lanark, Afton, Aden, Cambray, Myndus, crossing the Mimbres river bridge into Deming.

The Faywood, Hot Springs and Silver City side trip ought to be taken. A very high speed can be made going over the mesa to Tunis and Separ into Lordsburg. Passing Mansfield ranch at 16 miles and Two Wind-



IDLEWILD IN PICTURESQUE OGDEN CANYON

mill ranch at 23 miles, through Granite Gap, 7½ miles to Rodeo, the Silver creek wash at 34 miles, you enter Douglas, where the smelters are one of the sight-seeing points and should be visited at night if possible.

The road continues through Lowell, Hereford, Huachuca, Empire ranch, Live Oak gulch to the summit of the Santa Rita mountains and north on the mesa to Vail and Tucson, then either Red Rock or Oracle to Florence, visiting particularly Casa Grande ruins and the painted rocks, crossing the Gila river to Mesa and Phoenix, keeping out of Tempe. Tourists usually pay Bisbee a visit, leaving the regular road at Lowell. This city is situated with its residential section built on the sides of the gulch.

The Imperial valley road runs through Ogilby, Drylyn, Glamis, Mammoth, Brawley, Imperial, El Centro, El Campo, Potrero, Dulzura, Jamul, San Diego. Following the Pacific highway up the coast, you pass through La Jolla, Del Mar, Encinitas, Oceanside, Las Flores, San Luis Capistrano, Irvine, Tustin, Santa Ana, Anaheim, Fullerton, Habra, Whittier, Montebello and Los Angeles.

Many beautiful drives will be found in and around Los Angeles, one to Elysian park, another through Eagle Rock valley, to Monrovia, to Venice, to Glendale. A popular place for a good dinner will be found in Casa Verdugo; and the Cawston ostrich farm, the California alligator farm, the San Fernando and San Gabriel missions should receive a visit.



# Motor Truck Offers Touring Possibilities



HY not a motor truck for touring? Why not a real houseparty on wheels, traveling from place to place, camping beside lakes and streams for fishing, boating and bathing, and stopping or starting at will?

Imagine the possibilities of a motor truck fixed up for camp touring! There is room aboard for all the equipment one needs and comfort for the travelers in a real room. Under the car body are compartments holding foodstuffs, water, extra gasoline, a refrigerator, racks for tent poles and fishing poles, cots, etc. Inside the body are the cooking utensils, a gasoline stove and folding pan outfit, together with a big iron kettle for cooking beans at night a la lumber camp.

Here, too, are folding chairs, and benches, and a table or two of the folding type. A cabinet on the wall contains the folding washstand, while on the other side is a writing desk. In the ceiling are electric lamps, the current furnished by the generator of the self-starting outfit on the motor. There is an electric toaster and an electric percolator in the outfit for early breakfast for those who would a-fishing go. Here, too, when the machine is on the run are stored the hammocks, a cot or two and whatever extras are taken along.

On the roof are the canvas outfits, the awning devices, the corner boards for the extension floor, the canvas sides for rainy weather, etc., all in a railed enclosure where also are carried boxes of foodstuffs, etc.

By William B. Stout

The body might be arranged as in the sketches, with sides that let down when the party reached the camping place, forming an extension floor all about, as on the chapel wagon shown at the Chicago show. Once this was let down and braced from beneath, the canvas awning could be stretched from the roof of the car body, covering the extension, or, instead of this, a roof could fold up from the sides as on the French army workshop wagons. This would make a room of the rear of the truck almost big enough for a dance. The whole car arrangement could be set up in a half hour, and while this was going on the others could be off to the nearest farmhouse for milk, water and supplies of all kinds. This is a charm of gypsying that one never knows what the next stop will bring; buttermilk or whipped cream, sour bread or baked beans. But there is always canned soup!

Once the car is fixed a tent can be

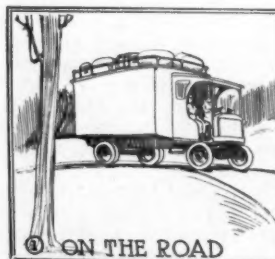
erected for the cooking, electric lights can be strung around through the trees and in the tent, hammocks would go up—if this were a mixed crowd, as most house parties are—and the canoe taken off the roof for the couple that wants to go on the lake. There is no end to what can be done on a motor-truck-camping-tour-house-party, all depending on the gameness of the crowd to enjoy things as they come, for the romance there is in it, and on the completeness of the equipment. Surely a 3 or 5-ton truck should be able to carry enough for a big house party.

At night bunks could be arranged in the body interior, three high, and cots arranged about the floor, curtains dividing the space into rooms. Seven or eight could be accommodated in the machine, and if there were more in the party tents pitched outside could accommodate them.

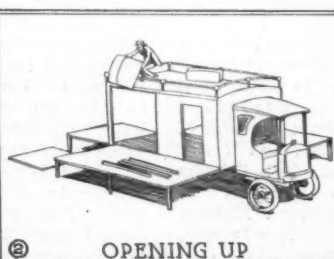
The small sketches show the stages of the opening up of the car and fitting it for habitation at camping places. Fig. 1 shows it on the road. Fig. 2 shows the machine after arrival at the stopping place. In Fig. 3 the floor is set, and the canvas awnings, brought down from the roof, are being stretched.

Fig. 4 shows a possible sleeping arrangement and an end view of the car set up for the night.

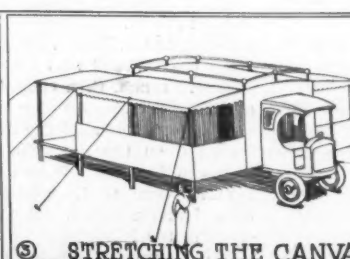
So much for the suggestion, and already you see the thousand and one things which could be arranged with such an outfit. By another season there will be motor-truck-house-parties on the road, and those who enjoy getting back to nature in new ways will have a new sensation in store.



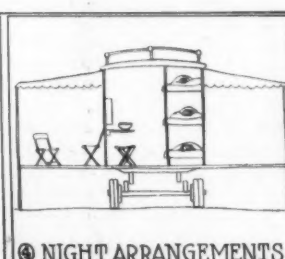
① ON THE ROAD



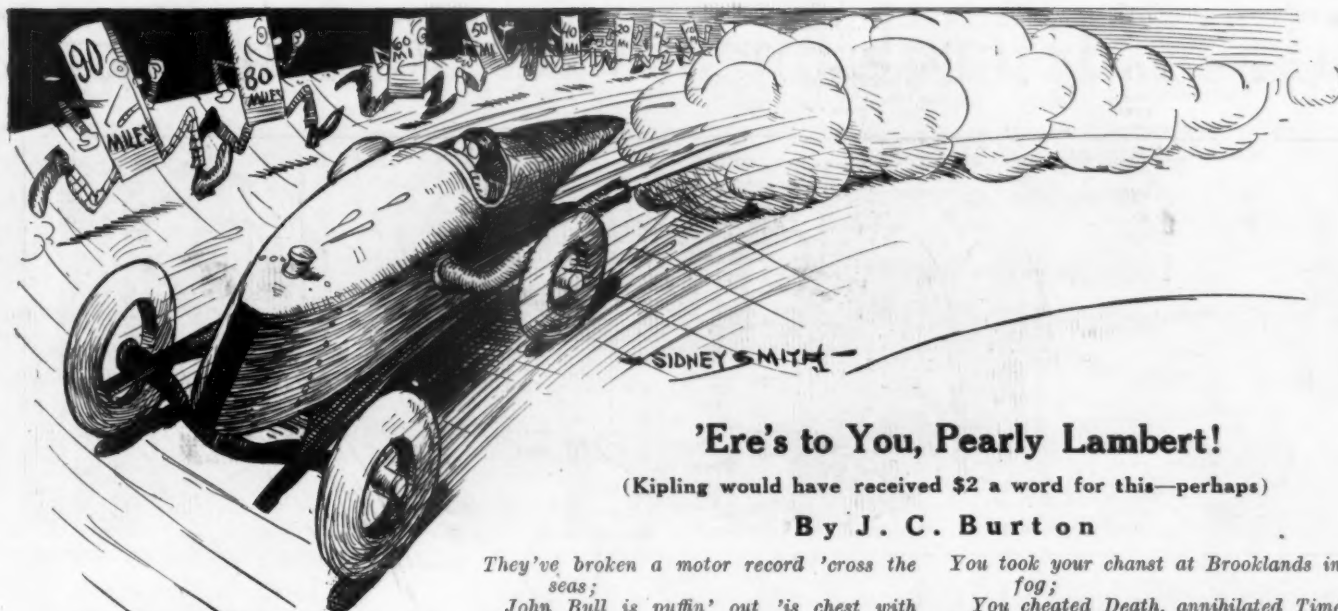
② OPENING UP



③ STRETCHING THE CANVAS



④ NIGHT ARRANGEMENTS



## Twenty Cars in Grand Prix French Close Lists with Good Field Nominated

PARIS, March 12—Special cablegram—All entries are now closed for the French grand prix race at Amiens on July 12. The list comprises twenty cars, of which two were entered at the last moment on payment of double fees. These eleventh hour entrants were a six-cylinder Excelsior, which probably will be driven by Arthur Duray, and a Schneider to be handled by Rene Thomas, who was a member of the Peugeot team last year. It was expected until the last moment that Fiat would enter a team of cars for this race. The German firms, Mercedes, Opel and Benz, also boycotted the race, and although the Belgian and English agents of the Mercedes company made every effort to put a team of cars in the race the factory persistently refused to give its consent.

Although the number of entries is small, this fuel consumption race will not be lacking in interest, for a very fast short course has been selected in the suburbs of Amiens, and the racing board of the French club has made such arrangements that the event will be more spectacular than any previous race held in France. The entry list, with the names of the drivers so far as they are known, is:

- |                             |                                 |
|-----------------------------|---------------------------------|
| 1—Sunbeam, Rigal.           | 10—Mathis, Mathias.             |
| 2—Sunbeam, Callois.         | 11—Itala, —.                    |
| 3—Sunbeam, Guiness.         | 12—Itala, —.                    |
| 4—Sunbeam, Resta.           | 13—Itala, —.                    |
| 5—Peugeot, Boillot.         | 14—Opel, Joerns.                |
| 6—Peugeot, Goux.            | 15—Schneider, Cham-<br>poiseau. |
| 7—Peugeot, Zuccar-<br>elli. | 16—Schneider, Gabriel.          |
| 8—Delage, Bablot.           | 17—Schneider, Thomas.           |
| 9—Delage, Guyot.            | 18—Schneider, —.                |

### QUAKERS START ROAD TEST

Philadelphia, Pa., March 8—The touring information bureau of the Automobile Club of Philadelphia this morning inaugurated a 30-day sealed bonnet test that promises to develop more practical information

They've broken a motor record 'cross the seas;  
John Bull is 'puffin' out 'is chest with pride;  
The British motorist is on 'is knees,  
Prayin' 'omage to the 'ero of a ride  
That London bobby brags of on 'is beat,  
Whose name is 'eard in ev'ry music 'all;  
The king and queen 'ave prais'd 'im for 'is feat,  
And talk o' knightin' 'im—and that's no stall.

So 'ere's to you, Pearly Lambert, and the record that you made;  
You're a bloomin' Henglish 'ero for the nerve that you display'd,  
And we'll 'ail you as a champion when the Milky Way is sour,  
For you jamm'd more than a 'undred miles within a fleetin' 'our.

Hi see you now,—your face is wreath'd in smiles,  
Your grimy 'and's clasp'd in 'is lordship's own;  
You're lookin' back at chagrin'd, vanish'd miles,  
You're 'appy to the marrow of your bone;  
A synonym for British nerve and pluck,  
You see in London press your 'umble name;  
The world fills up its glass to wish you luck  
And welcomes you to motor's 'all of fame.

Then 'ere's to you, Pearly Lambert, you're a sturdy man of grit,  
And we 'opes that you'll rest easy, that the bally niche will fit;  
We respects you for the way you made the bloomin' mile stones cower  
When you jamm'd more than a 'undred miles within a fleetin' 'our.

than anything heretofore attempted in that line. Determining the condition of roads included in the club's tours, those that are being properly kept, new and undeveloped routes, the capability of a car for winter touring, quantity of gasoline required, average daily mileage and data for the information of motor truck manufacturers on the possibilities for regular motor truck service between the farmer and the city market are some of the things on which it is expected to get accurate figures.

The car selected for duty is a Multiplex raceabout and it made its start this morn-

You took your chanst at Brooklands in the fog;

You cheated Death, annihilated Time,  
(Our Pegasus is knee-deep in a bog,  
Unguided by the reins of runic rhyme)  
And like a spider on a saucer's rim,  
You whirl'd around that track like one insane,  
Knowin' the odds against your life were slim  
But facing Fate with haughty, cold disdain.

So 'ere's to you, Pearly Lambert, would Hi 'ad a 'Omer's lyre  
To sing your bloomin' praises on a twangin' E flat wire!  
You're an 'onor to your country, you're an 'onor to your sport,  
They'll present you with the garter when George welcomes you at court.

With exhausts poppin', engine spittin' grease,  
With track a blur of wet, forebodin' black,  
A dark monotony to make you cease  
A flight where Death was ever at your back,  
You fought it out and earn'd a nation's praise,  
You conquer'd 'cause your nerves are forg'd of steel;  
And to this toast our flagons now we raise,  
"The gamest Brit that ever took the wheel."

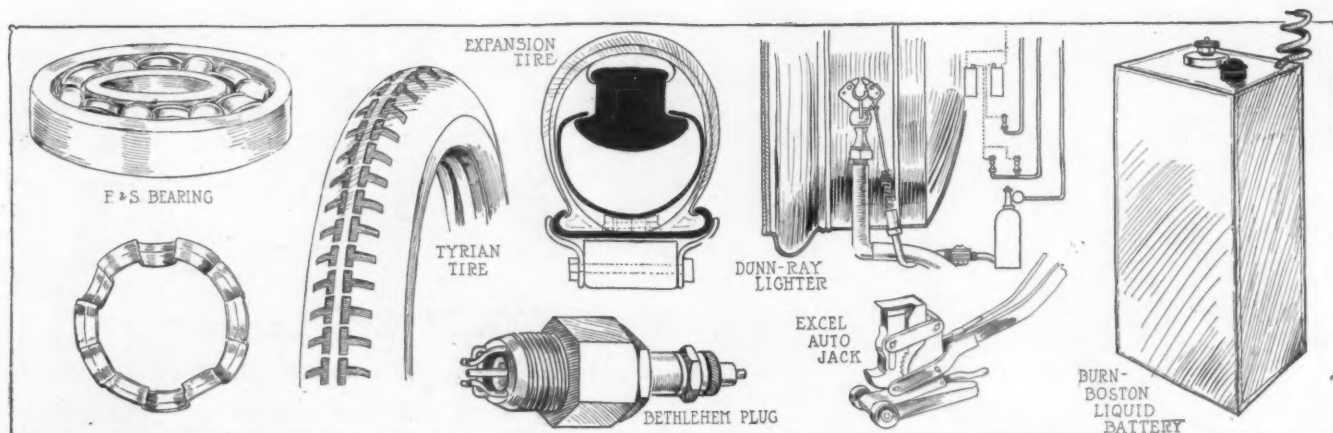
Then 'ere's to you, Pearly Lambert, we would like to shake your 'and,  
If you'll journey to Hamerica, we'll meet you with a band;  
You can borrow jitneys of us, you can smoke our last cigar  
And we'll let you break a record in a 'igh-class Yankee car.

ing at 7 o'clock from the garage of the Automobile Club of Philadelphia, in Twenty-third street below Market. The route for the first day took in Reading, Lebanon to Harrisburg, 108 miles, and return. The return trip included Elizabethtown, Lebanon, Lancaster, Laurensville, Paoli to Philadelphia, 102 miles. The actual running time was about 10 hours.

Every morning at 7 o'clock the car will check out from the club house, and cover a route of from 150 to 250 miles, returning to be checked in at night. The car will receive the same care as any other member's car using the club's garage.



# Some Motor Fitments of Various Sorts



**EXPANSION Tire**—The Expansion tire of the Expansion Spring Rim and Tire Co., Boston, Mass., has an outer shoe similar to the standard pneumatic casing, but instead of using an inner tube filled with air employs what is termed an expansion core supported in conjunction with a crescent-shaped retainer, which holds the core outward against the tread portion of the casing. The core is made up of alternate sections of rubber and a non-compressible material. It normally fills not more than one-half of the internal space in the casing, the space occupied being that closest to the tread. In operation the flexible core in combination with the spring-retainer is looked upon to absorb the jar and it is claimed to distribute this jar around a considerable portion of the wheel periphery.

**Cataract Tire**—The Cataract diagonal block tire for motor trucks differs from other block tires by virtue of the diagonal positioning of the blocks on the rim. The blocks are of such size that upwards of a dozen are used to extend around the wheel. They are made in either single or double rows, according to the width required. The blocks are flanged on both sides and have a steel-trellised base moulded into the rubber and extending to the extreme edge of the side flange which secures the blocks in position. The blocks are flanged on both sides in order to fit snugly into the row of steel rims and are additionally fastened by cross-sectional steel strips with three bolts inserted through the strip and wheel and tightened by nuts on the inside, this being done to avoid any possibility of creeping and stretching. The diagonal construction is used to eliminate vibration, as with it there are three blocks at a time in contact with the road, and at all other times two blocks carry the weight, in this way making rolling smooth. In case of damage a block is removed as in the various types of block tires now on the market.

**New Era Tire**—The New Era tire casing, a product of the New Era Tire and Rubber Co., Boston, is made up of five layers of para gum alternating with layers of coarse Egyptian cotton fabric. Outside of these is placed the cushion and breaker strip made of pure gum and liberal thickness in the tread portion. Outside of this comes the binder formed of compounded rubber, thickened slightly at the tread and extending clear around the fabric and forming the outside lower wall of the tire. Lastly comes the tread of white rubber. These casings are made in standard clincher sizes from 28 by 3 to 37 by 5-inch sizes.

**Triplex Inner Tube**—The Triplex inner tube is, as its name suggests, in reality three different tubes, three being used so that in case one is punctured it calls for a second

**NEW ENGLAND** always has been noted among the motoring fraternity as a section where the greatest interest was manifested in the little things that are calculated to make motoring, and touring in particular, more pleasant and comfortable. That such is the case is illustrated by the number of accessories and minor fitments of the cars which are on display at the Boston show. More than 1,000 different articles for the comfort of the car-user are on exhibition, 1,116 distinct kinds of accessories, to be exact. These are the products of 232 makers, more than Chicago's show could boast, and nearly as many as were on display at the Grand Central Palace and the Madison Square Garden at New York. The motoring world has come to look to Mechanic's hall each year for new ideas in accessories. It was not disappointed this year. Some of the new things among the accessories at Boston that have not appeared at other shows this year are described on this and the following pages.

inflation to bring the second tube into use, and in case of its puncturing an additional inflation will bring the third tube into service. A three-way valve arrangement is used so that each tube can be inflated separately. When the outer tube is being used the two inner ones fold against the inside half of the outer tube so as to be away from the tread of the tire in case of puncture. Inflating the second tube simply causes it to fill all the space within the first one. Inflating the third tube, which is the innermost of all, acts in a similar manner. It is made by the Triplex Tube Co., Boston, Mass.

**Tyrian Tire**—Tyrian tires and inner tubes, made by the Tyer Rubber Co., Andover, Mass., are manufactured by a concern which has been in the rubber goods business for more than 50 years. Casings are made in plain or non-skid tread. The non-skid tread consists of two rows of T-shaped depressions in the tread. These depressions are positioned so that the stems of the T's point toward the hub, one row on the outside of the tire, the other on the side next to the body, and a smooth tread strip remaining between them. This style of non-skid carried with it the argument of having sharp edges of rubber to offer resistance to skidding to either side as well as to a circumferential slip. Tyrian casings are built up of para rubber and Sea Island cotton.

**Excel Motor Jack**—The Excel motor jack, built by the Excel Jack Mfg. Co., Boston, is of the long-handle style, and designed to be used with the operator standing up; in other words, the jack can be positioned under

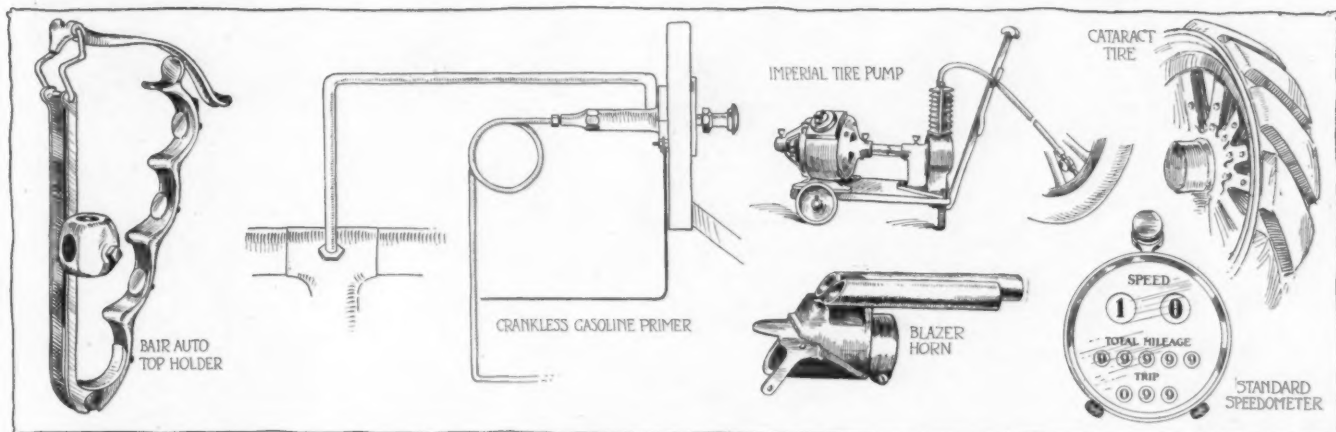
either the front or rear axle and operated without the operator having to assume an uncomfortable position. To facilitate this the pedestal, or stand, is mounted on two wheels at its forward end, these wheels enabling the jack to be readily pushed into any position under the axle. The jack is operated by an up-and-down movement of the handle.

**Ingersoll Air-Compressors**—The Ingersoll-Sargeant Drill Co., Boston, has a various line of air-compressors for garage use, some of these being air-cooled and others water-cooled. Some types are stationary and others mounted on three-wheel trucks, on which are also mounted the electric motor for operating the compressor. The motors used in these air-compressors are for 110 and 220-volt circuits. They are also made for three-phase, 60-cycle, 110, 220 and 440-volt circuits. The company also furnishes them for single-phase alternating circuits of 110 and 220 volts. These compressors are made with various cylinder sizes, namely, 2½ by 3 inches, 3½ by 4 inches, 4½ by 5 inches and 1 by 1¼ inches. What is known as the Imperial tire pump is a combined air-cooled, single-cylinder pump with an electric motor on a three-wheeled truck, with 1 by 1¼-inch cylinder. It operates at 1,700 revolutions per minute, and is claimed to inflate a 35 by 4-inch tire up to 70 pounds' pressure in 3 minutes. The Imperial 12 is also a combined pump and motor mounted on a truck. The single-cylinder air-cooled motor measures 2½ by 3 inches bore and stroke. It operates at 450 to 700 revolutions per minute.

**Ozo Carbon Remover**—This is a garage outfit consisting of an oxygen tank and burner for burning out carbon from the cylinder by the aid of Ozo. Ozo is a flameless gas which consumes the carbon without the use of fire. It is operated by leading the tube from the gas tank and regulating apparatus through the spark-plug or valve cap of the cylinder. The use of this apparatus does not require the motor to be dismantled further than the removal of the spark-plug. The work can be done on an ordinary four-cylinder motor in 20 minutes. It is operated by one man, who merely holds the nozzle of the hose through the opening of the cylinder until the carbon has been completely burned from the cylinder. The temperature of combustion is not high enough to fuse the plugs or do any other damage. This device is made by the Ozo Co., 18 Tremont street, Boston, Mass.

**Crankless Gasoline Primer**—The purpose of this device is to supply an evaporized mixture of gasoline to a point in the inlet manifold close to the cylinders in order that the motor will respond promptly to the electric

# As Seen at New England's Big Show



starter and reduce the current consumption and wear on the starting device. Besides this its object is to make starting more certain. The crankless primer consists of the valve casing containing two valves. The casing is mounted on the inside of the dash. Projecting on the inside of the dash is a valve stem made of selected Tobin bronze, on which is mounted a locknut and nickel-plated foot button. Should the starter not operate quickly the foot button is pressed, allowing a mixture of gasoline and air to be forced into the manifold. As shown in the illustration, Fig. —, the gasoline is taken from the feed pipe between the carburetor and the tank. The two valves draw in the gasoline and air and a pressure on the button forces the mixture into the manifold. This device is made by the Cox Brass Mfg. Co., 899 Boylston street, Boston, Mass. \*

**Arnold Electric Vaporizer**—An electric heating device placed in the air intake of the carburetor in order to secure hot air for starting purposes is supplied by the use of this instrument. The vaporizer consists of an electric resistance, coil, battery and switch. When the switch is thrown on the vaporizer becomes hot in 30 seconds. The carburetor is then flooded in the usual manner and the motor started with the crank or starting apparatus. The switch controlling the vaporizer is not shut off until the motor becomes sufficiently warm to run without the aid of the preheated air. This is made by the Arnold Electric Co., 93 Massachusetts avenue, Boston, Mass.

**McDonald Leaded Glass**—Leaded glass headlights, while not appealing to those using the car for country travel, make excellent distinctive marks for the car when used in city work. Town cars are especially adapted for these lights. The side and tail lights are greatly beautified by the use of these distinguishing designs which are made up in the form of monograms, crests, emblems, initials or devices in desired colors and set in the automobile lamp. Red Cross marks for physicians are particularly appropriate in leaded glass. This is made by Donald N. MacDonald, 400 Northampton street, Boston, Mass.

**J and B Light Controller**—This switch controls the output of the Ford magneto in order that when this instrument is used to generate current for the lights the bulbs are held at their full candlepower, regardless of the motor speed. When the motor is running at high speed the bulb goes beyond its full incandescent and the filament is fused out. The controller is installed directly forward of the carburetor. It is operated by the lever which controls the throttle. The use of the device enables the current

to be controlled to such an extent that it can never burn out from excess current. The only labor necessary is to drill three  $\frac{1}{8}$ -inch holes between the motor base and frame. The connecting levers are arranged to fit the present carburetor. This is made by the J and B Mfg. Co., Pittsfield, Mass.

**Headlight Glare Remover**—It is difficult to drive against the glare of approaching headlights. In order to rob these of dazzling power this device has been designed. It consists of an amber-colored glass clipped to the windshield in such a position that the driver can see through it by merely inclining his head. When a car is approaching and the glare becomes too dazzling, it is merely necessary to look through the colored glass. It is made by William L. Toby, 9 Louis street, East Boston, Mass.

**Driver Lamp**—These lamps are made in such manner that the bulbs cannot be stolen, cannot rattle and do not require polishing. It may be used for side, rear or dash lights and operate on a 6-volt cell. The rear lights are so designed that they are operated from the rear of the car to comply with the Illinois state law and similar laws pending in other states whereby it is required to control the tail light from the rear. They are sold by the Standard Auto Supply Co., Boston, Mass.

**Dunn-Ray Lighter**—Utilizing a new principle for igniting acetylene lights from the seat, the Dunn-Ray lighter is particularly convenient. Every other device of this type requires a jump or make-and-break spark. This device consists merely of a platinum wire passing through the gap between branches and an electric battery. The wire becomes incandescent in about 2 seconds after the switch is thrown on and lights the gas by means of this incandescence. By the aid of the device, which is equipped with a controller on the dash, the lights may be turned higher or lower from the seat. It is made by the Dunn-Ray Co., Boston, Mass.

**Blazer Horn**—This is an exhaust horn for Ford cars, and is one of the most simple devices of its kind ever produced. It can be attached by slipping the pipe holding the horn over the end of the Ford exhaust pipe and by connecting with a pedal. It consists of two whistles which are blown by the exhaust gases diverted by a flap valve operated by a bell crank lever, and held in place by a coil spring. As the horn is tilted down it is impossible for it to become clogged, the dirt being shaken out by the vibration of the car. It is made by the Motor Specialties Co., Cambridge, Mass.

**Bethlehem Five-Point Spark-Plug**—The five points of the plug are arranged with one in the center, which forms one electrode, and the other four distributed in a hollow square about the central point and forming the

other electrode. The object of the plug is to prevent carbonization by the use of two of the points at one time, allowing the carbon to be burned out of the other points during that time. It is a well-known fact that increasing the temperature of an electric conductor also increases its resistance. When two of these points become hot the spark will jump across the coolest gap. The body of the plug is made of Bethlehem steel insulated with German porcelain. A feature of the plug is the distance that the points extend below the body. The plugs are made by Victor G. Goulding, Holyoke, Mass.

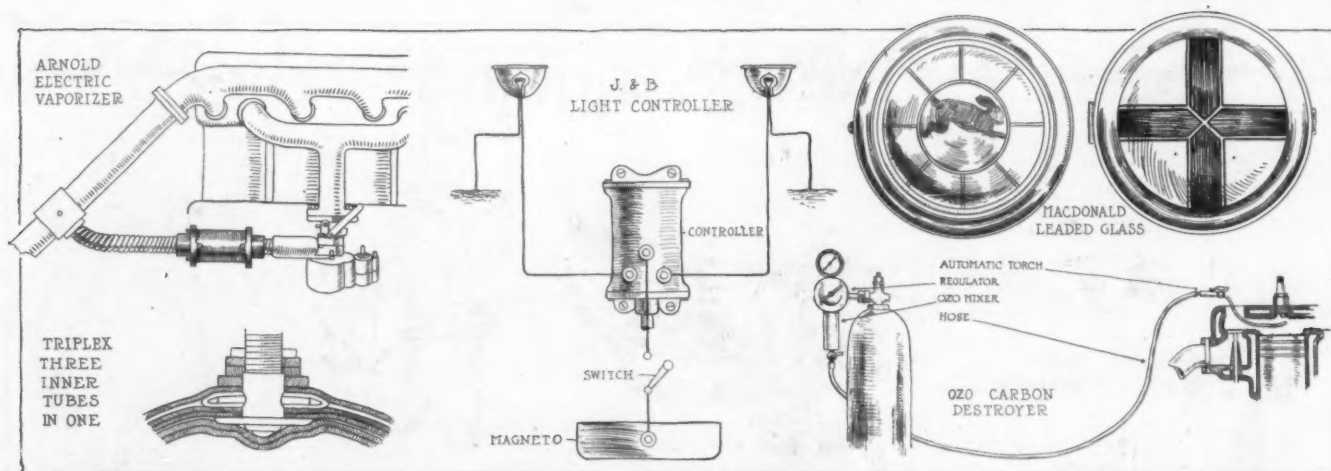
**Burn-Boston Battery**—This battery is a liquid cell using a special form of salt solution electro light. The design of the battery is such that rapid circulation is allowed to permit of excessive overload and of obtaining an even distribution of wear through all parts of the current producing material. The zinc shell is insulated from the electrolyte and cannot be acted upon by it. Except for a pin-hole vent the cell is tightly sealed, thereby doing away with all sources of leakage. The liquid employed as in the electrolyte gives forth no noxious gases and is non-freezing. These cells are made by Burn-Boston Battery & Mfg. Works, Boston, Mass.

**Ko-Nek-To Battery Terminal Blocks**—Many wires are broken because the insulation chafes across the edge of the battery box. This results in short-circuits and broken leads. The connector apparatus changes the terminal points to the exterior of the battery box and renders it possible to disconnect wires rapidly and to remake the connections without the necessity of soldering joints. The connector battery terminal blocks are designed to be used with all electric cranking and lighting systems, and since the co-connections are securely made they greatly assist in maintaining the required efficiency and output. The inside insulation is permanent and is vibration-proof. The cells are made by the Detroit Electrical Appliance Co., Detroit, Mich.

**Tremo Horn**—This horn is designed for Ford cars and is operated by the exhaust. It is fitted to the exhaust pipe of the car by clamping the horn shank directly to the pipe. It can be attached in a few moments. The horn is operated by a pedal which opens a flapper and allows the exhaust to be blown across the mouth of the whistle. A feature of the horn is that it can be blown when the motor is throttled down as well as when it is operating at higher motor speed. It is made by D. Henry Bonner Company, Cambridge, Mass.

**Bair Top Holders**—These have been adopted as standard equipment on 19 important makes of automobiles for the 1913 season. They hold the top tightly in place, keeping





the bows separate and tightly in place by a strap and spring. The bows fit into separate notches arranged in a line on the top holder, and when clamped in place cannot move. Bair bow hinges are adjustable and can be arranged to make the top the desired shape. This is effected by set screws under each flap. They are made by the Auto Specialties Mfg. Co., Chicago, Ill.

**Standard Speedometer**—A new Standard centrifugal speedometer, which has made its first appearance at the Boston show, indicates the speed by large figures shown at the top of the dial. The total mileage is shown below the speed dial, and below this is the trip mileage. There are two sets to the instrument, first a selective set, by which the mileage may be set at any desired point, and second, a zero set by which the mileage is set back to zero. These speedometers are made by the Standard Thermometer Co., Boston, Mass.

**New Era Springs**—These springs are made to fit standard makes of cars, and can be furnished in any desired color. They replace the original spring in case of breakage. They are made of high-carbon steel and of such quality that it would be more satisfactory to buy the complete spring than to risk the type generally made by local blacksmiths who use, as a rule, a low-grade carbon steel. A large assortment is carried in stock, and may be secured at short notice. They are made by the New Era Mfg. Co., Waterbury, Conn.

**Detroit Force-Feed Oiler**—The oiler and tank are combined in a rectangular box. The oil is drawn up from the bottom of the box which forms the oil reservoir by a series of small pumps actuated by a shaft passing through the length of the box. The number of these pumps depends on the number of leads required by the particular motor to which the oiler is fitted. The shaft has a worm upon it for each small pump, which gives a reciprocating drive to this part of the mechanism. The oil is taken up through the vertical lead and dropped down to the tubes which carry the oil through the motor. The ends of the lead running up from the bottom of the box project through the top of the box and are curved to allow the oil to drop down into the heads of the motor leads, which are given a cup shape. The top of the box is covered with glass to allow the operator to observe the flow of oil. Each pump can have the length of its stroke regulated so that the flow of oil is under control. The lubricator is made by the Detroit Lubricator Co., Detroit, Mich.

**Boston Starter**—This is a mechanical starter which is operated from the seat. A cable projects through the dash which, when pulled by the operator turns the wheel, which is in turn connected by chain to the crankshaft. A pull on the cable spins the motor

at a sufficient speed for it to start. An automatic release is provided as a protection in case of back fire, and as a further precaution the spark is automatically fully retarded before the engine is turned over. The starter can be attached without interfering in any way with the car and does not change the appearance of the latter as the whole device with the exception of the starting handle is located beneath the hood. A big advantage of this starter is that it is ready for use whenever the car becomes stalled. It is made by the Auto Appliance Co., Boston, Mass.

**Campbell All-in-Mesh Gear Transmission**—As suggested by the name this gearset always is in mesh. This principle is secured by the use of a tilting or rolling key which forms internal contact with the gears. The transmitting action is obtained by merely sliding the key or keys along the groove in the shaft until they slip under the rings of the desired gear, after which the key automatically and with positive action tilts into contact with a series of lugs placed on the inner circumference of the gear. The gear becomes a part of the shaft, turning with it and transmitting the power from the motor to the rear axle. This gear was designed by the Economy Equipping Co., Chicago, Ill.

**Tuthill's Titanic Spring**—This spring, which has been on the market for some time, has been designed to replace those on standard makes of cars. It is guaranteed against breakage between the clips. According to the makers the advantages of this spring are that 90 per cent of the breakages are eliminated and that owing to the fact that there is no hole through the center of the spring 25 per cent is added to the strength. The material of which the spring is composed is a silico-manganese composition of special analysis. It is made by Tuthill Spring Co., 760 Polk St., Chicago, Ill.

**O-Tak-A Jr.**—This is a special tool for removing punctured tires. As shown in the illustration it is similar in form to a pair of pliers, with curved hooks. One end slips beneath the rim and the other pushes up against the tire. When the hand is squeezed the point of the instrument pushes the tire away from the clincher rim. After the tire is loosened the tool can be raised, thus lifting the bead away from the rim, allowing the tire to be easily removed. It is made by O-Tak-A Tire Remover Co., Leroy, N. Y.

**Dependo Gasoline Gauge**—This gauge attaches to the dash and indicates at a glance the amount of gasoline in the tank. It operates up hill or down and is of simple construction. The needle is swung from the top of the dial and the scale reading in gallons is at the lower part. At any moment the amount of gasoline in the tank can be determined from the gauge. This gauge can be fitted to any car using a gravity feed

tank. It is made by C. F. Roper and Co., Hopedale, Mass.

**F. and S. Ball Bearings**—Characterized by a new retainer these bearings are of particular interest. The shape of this retainer and its construction is shown in Fig. 0. It allows the very small space between the balls so that a maximum number of these may be carried in addition to the fact that they are guided perfectly and that there is no possibility of inter ball contact. A solid cage construction is used and its form is such that no parts can get between the balls and wedge them in case the cage breaks; or, the makers claim that should the cage break the work of the bearing will not be disturbed. They are imported by the J. S. Bretz Co., New York City.

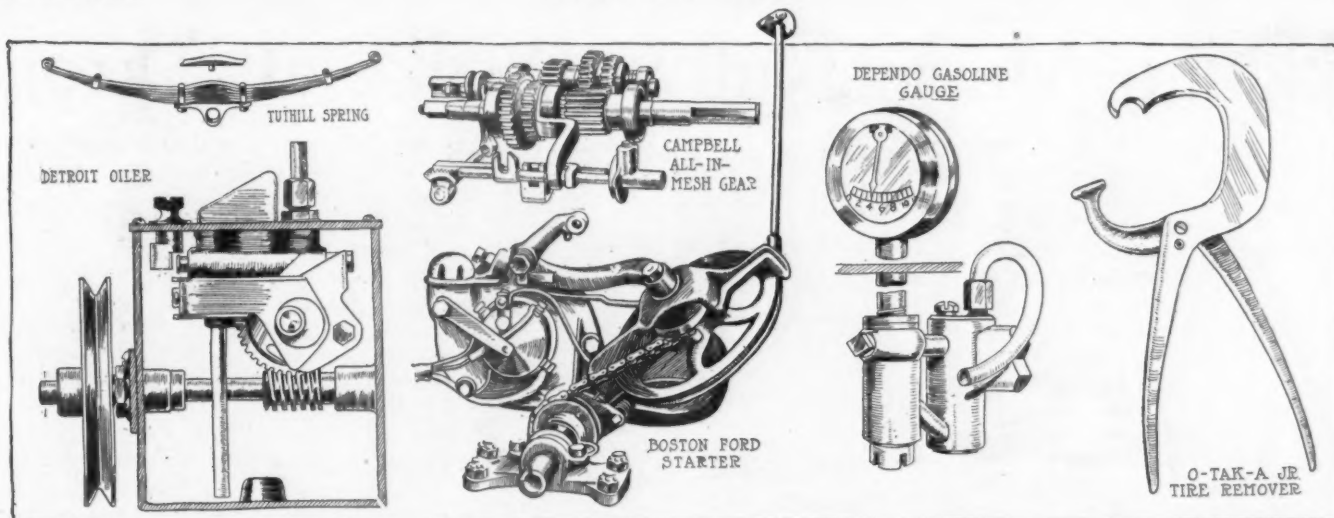
#### CLASH OVER MONARCH NAME

Detroit, Mich., March 10—It has developed that L. G. Hupp, formerly of the R. C. H. Corp., and his associates, cannot make use of the name Monarch Motor Car Co., for the new car concern which they have launched recently, as announced in the February 27 issue of Motor Age. Two applications for this title were filed at Lansing at about the same time, that of Mr. Hupp being superseded by a few hours by an application fathered by A. J. Bloom, F. J. Priest and E. L. Wallace, who have incorporated with a capital of \$30,000 to manufacture motor cars.

Bowing to this finding, Mr. Hupp has determined to abandon the Monarch name and instead style his concern the Tribune Motor Co.

#### WILL BROWN IN ANOTHER COMPANY

Peru, Ind., March 10—Through the efforts of Will H. Brown, and the directors of his institution, the Brown Commercial Car Co., another industry has been added to this city, the Crum-Wiley Mfg. Co., of which Mr. Brown will be a director. The company will manufacture all motor accessories made in brass, its specialties being grease cups, and other small parts used in the building of all kinds of motor. The directors of the new company are, besides Mr. Brown: E. L. Crum, president; Max Kraus, vice-president; S. A. Shesler, secretary-treasurer, and J. R. Woodring. The company formerly was located in Decatur, Ill., but was brought here by Mr. Brown.



## Uncle Sam Orders 100 Motor Cars for Parcel Post Service

WASHINGTON, D. C., March 6—One of the last official acts of Postmaster General Frank H. Hitchcock, before he was succeeded by Albert Bursleson, was to sign the recommendations made by the committee of award for the awarding of contracts for furnishing 100 motor vehicles for the parcel post service, as they may be ordered during the fiscal year ending June 30, 1913. These vehicles will be distributed throughout the country. The contracts were awarded as follows:

White Co., New York, five White cars, 1,500 pounds capacity, \$2,000 each; Stewart Motor Corp., Buffalo, ten Stewarts, model F, 1,500 pounds capacity, \$1,440 each; Kissel Motor Car Co., Washington, ten Kisselcars, 1,500 pounds capacity, \$1,350 each; Durant-Dort Carriage Co., Flint, Mich., ten model C, 1,600 pounds capacity, \$1,225 each; Louis J. Bergdoll Motor Co., Philadelphia, ten Bergdoll "30" delivery cars, 1,500 pounds capacity, \$1,240 each; Atterbury Motor Car Co., Buffalo, ten model A, 1,500 pounds capacity, \$1,323 each; Willys-Overland Co., Toledo, ten model 69 delivery special, 900 pounds capacity, \$1,000 each; Studebaker Corp. of America, Detroit, five Studebaker 20 delivery wagons, 750 to 1,000 pounds capacity, \$755; Prest-O-Lite tank, \$25 extra; C. B. B. Motor Car Co., Washington, ten Modern model B, 1,000 pounds capacity, \$1,270 each; Waverley Co., Indianapolis, five Waverleys, 1,000 pounds capacity, \$1,739 each; Kentucky Wagon Mfg. Co., Louisville, five model 10 Urban, 1,000 pounds capacity, \$1,793 each; Ward Motor Vehicle Co., New York, five commercial, type EA, 1,000 pounds capacity, \$1,975 each; Baker Motor Vehicle Co., Cleveland, five commercial, model H, 1,000 pounds capacity, \$2,000 each.

Each car is to be equipped with the usual accessories, including windshields, lamps, horns, storm curtains, tools, etc. The price in each instance is f. o. b. factory. Wheels of all electrics are to be provided with standard rims adopted by the Society of Automobile Engineers.

All cars are to have panel bodies, the inside to be protected by strips of hardwood, at least 1½ inches in width and 2-8 inch thick, extending the length of the body and screwed to the uprights not less than 3 inches apart,

the full height of the body; and on each side of the body there is to be securely screwed to the uprights a hardwood or metal strip, about midway of the side, projecting not less than 1 inch from the uprights, on which may be placed racks or crates so that two tiers of hamper or crates containing parcels may be loaded into the car.

The rear of the bodies of all cars are to be equipped with doors which can be securely locked, having circular windows. The seat of each car is to be equipped with a double lazy back, so that the carrier may have ready access to the parcels. Cars are to be painted vermilion red with uniform trimming and lettering.

In each instance it was stipulated the award was made upon condition that the bidders submit to the postoffice department for approval specifications showing in detail the material and construction of the bodies and painting and lettering of cars which they propose to furnish.

### GRABOWSKY SETTLING

Detroit, Mich., March 10—The Security Trust Co., trustee in bankruptcy for the Grabowsky Power Wagon Co., is now returning to creditors of the defunct Grabowsky concern a dividend of 20 per cent, providing they have filed valid claims. An additional dividend of about 15 per cent will be distributed to wind up the remaining assets when such action is ordered by the Federal court.

The Grabowsky concern was adjudicated a bankrupt in November last by Judge Tuttle in the federal court, and at the time of the appointment of the Security Trust Co. as trustee, the liabilities totaled about \$400,000. The plant was later sold to the Edward G. Budd Mfg.

Co., maker of bodies, for the sum of \$110,000, while the Seitz Automobile and Transmission Co., Wyandotte, Mich., purchased the physical assets, including machinery, patents, cars and parts, for \$55,000.

### LOZIER TO INCREASE STOCK

Detroit, Mich., March 8—At a special meeting of the stockholders of the Lozier Motor Co., to be held on March 19, the capital stock of the company will be increased from \$3,000,000 to \$5,000,000, according to a statement issued by President H. M. Jewett, who gives as a reason for the increase the necessity for extending the manufacturing facilities, the large sales of the light six having overtaken the present plant.

The Lozier concern's present capitalization consists of \$2,500,000 in common stock and \$500,000 in 7 per cent preferred. The contemplated increase is \$1,000,000 common and \$1,000,000 preferred.

### NEW HUDSON BUILDING

Detroit, Mich., March 10—Another factory is to be added to the 26-acre plant of the Hudson Motor Car Co., the third within a year. The new structure is 578 feet in length by 90 feet in width and supplants the section of the factory grounds which resembled a tented city. The latter existed because contractors could not complete buildings fast enough to take care of the increasing demand for the cars.





# Rioting Marks Rubber Strike at Akron

**A**KRON, O., March 10—Briefly told, the rubber strike situation in this city at this writing is as follows:

Local and imported I. W. W. leaders are yet struggling to keep the remnants of their organization together. This is being done by street parades and meetings. Three hundred reserves are here from all over the country and are known as the "strong arm squad." The strike leaders have prepared a new scale and have sent it to the manufacturers. The demands made by the strikers have been characterized as absurd. There have been several cases of rioting and the police have been forced to use their clubs. There was a riot at the Goodrich plant Friday night.

## Many Return to Work

Hundreds of strikers, who had been marching under the I. W. W. flag a week ago, have broken away from the leaders and now are back at work. The strike leaders claim to have 5,000 men and women with them. Their last parade on Saturday afternoon showed their strength to be about 1,000. Of these 300 were imported men and another 300 never had been inside the rubber factories here.

At the Goodrich, Goodyear, Firestone and other local plants it is claimed by the head officials that hundreds of men have returned to work and that conditions are fast becoming normal. The Goodyear has announced that night shifts will begin work at once. The manufacturers claim that out of the 25,000 people in the factories fully 75 per cent are back at work. There are hundreds who would return to work at once were it not for the fact that they are afraid of being attacked by the I. W. W. men.

There was renewed talk today of quickly organizing a vigilance committee to be composed of hundreds of business and working men of the city and making an attempt to drive the I. W. W. agitators from the city. This may follow if the situation is not soon cleared.

## Senatorial Probe Continues

In the meantime the senatorial probe committee is yet at work. A midnight session was held Saturday after an all-day session. The senate committee expects to complete its investigation this week. Up to the present time F. A. Seiberling, president of the Goodyear Tire and Rubber Co., and H. S. Firestone, president of the Firestone Tire and Rubber Co., are among the manufacturers who have been before the senate probe committee.

A dozen or more of the strikers and a few of the I. W. W. leaders also have testified before the state committee. Among the leaders was George H. Speed, chief organizer of the I. W. W. Speed closed his testimony before the state committee with these words: "There is but one bargain that the I. W. W. will make with

## Motor Car Tire Concerns, However, Believe Worst Is Over

By J. A. Botzum

the employing class—complete surrender of all control of industry to the organized workers. In short, the I. W. W. advocates the use of militant direct action tactics to the full extent of our power to make good." This defiant statement on the part of Speed was like the dropping of a bomb in the senate probe room. Members of the committee openly commented on it. Speed told the state committee that the factories belong to the strikers and that they would take them.

So far but one witness has testified before the committee that has in any way had a tendency to show that the I. W. W. strikers have any grounds for grievance. That witness was a girl, who was before the committee Saturday night. She testified that one day she received but 32 cents for 10 hours on piece work. It was also shown that she was sickly and had often been in the hospital at the plant. Another girl testified that her average pay for 2 weeks was \$23.

H. S. Firestone, president of the Firestone Tire and Rubber Co., was before the committee all day Saturday. He testified that the average monthly earnings of his employees outside of the superintendents, department foremen and assistants

on salary, for the month of January was \$66.65. He placed the average monthly earnings at \$64.95.

Firestone said that while he was at all times ready to meet with his employees that he never would meet with any committee from the I. W. W.

Mr. Seiberling, as did also Mr. Firestone, denied emphatically that there is a combine on among the rubber men of Akron to maintain prices. One of the state senators wanted to know of Seiberling something about the speeding up system. Seiberling went into detail and closed this way: "We are the speeders-up of Akron, and we have made product over three and a half, done more per foot floor space than any institution in Akron and I am proud of it. The men have made wages such as they never dreamed of in the days before."

## Grand Jury May Investigate

There is talk of the grand jury making an investigation of where the \$8,000 collected in by the I. W. W. leaders here has gone to. The state probe committee will also look into this. The strikers have as their local leaders Mrs. Margaret Prevey, wife of Frank M. Prevey, a socialist, who has for 5 years been attempting to gain political power here. It was Mrs. Prevey who led the strikers to the Goodrich plant where the riot occurred Friday night. Prevey and his wife have urged the I. W. W. leaders on, it is claimed, and are reported to have said that Akron's rubber plants must be taken and controlled by the laboring people.

## Demands Made by Rubber Strikers at Akron

That all employees now on strike shall be reinstated in their old positions and not be considered as new employees.

That the union workday shall be one of 8 hours, 6 days in the week.

That all workers shall be paid double time for overtime.

That all male and female employees shall be paid not less than 22½ cents an hour.

That all male inspectors shall be paid not less than 55 cents an hour.

That all female inspectors shall be paid not less than 30 cents an hour.

That all inspectors shall be experienced men and women.

That all tiremen, machine men and finishers shall be paid not less than 55 cents an hour.

That all apprentices in the pit shall be paid not less than 30 cents an hour.

That all men curing tires shall be paid not less than 60 cents an hour.

That all truckers trucking tires or cores shall be paid not less than 60 cents an hour.

That all tire buffers, cementers, treaders or wrappers shall be paid not less than 55 cents an hour.

That all tube builders, ply cutters, or tread cutters shall be paid not less than 50 cents an hour.

That all stock carriers shall be paid not less than 45 cents an hour.

That all calendar men shall be paid not less than 50 cents an hour.

That all wind-up men shall be paid not less than 55 cents an hour.

That all mill men shall be paid not less than 55 cents an hour.

That all mill men shall be paid not less than 50 cents an hour.

That all feed men shall be paid not less than 45 cents an hour.

That all wind-up helpers shall be paid not less than 42½ cents an hour.

That all extra helpers on calendars shall be paid not less than 42½ cents an hour.

That all tire men shall be paid not less than 25 cents an hour to start.

That experienced tire men shall be paid not less than 55 cents an hour.

That electricians shall be paid not less than 40 cents an hour.

That all first class electricians' helpers shall be paid not less than 30 cents an hour.

That all second class electricians' helpers shall be paid not less than 25 cents an hour.

That all electricians' apprentices shall be paid not less than 20 cents an hour.

That all oilers and motor tenders shall be paid not less than 27½ cents an hour, and that electricians shall have double pay for Sunday and holiday work.

Steam fitters, pipe fitters shall be paid 45 cents an hour.

Steam fitters' helpers shall be paid 35 cents an hour.

All straight wrappers, cross wrappers, pulling and blowing on tubes and cutting tubes shall be paid 50 cents per hour.

Bag rollers and pulling tubes shall be paid 40 cents an hour.

All first class machinists shall receive 60 cents an hour.

All erectors and bench hands shall receive 50 cents an hour.

All handy men shall receive 40 cents an hour.

Machinists and helpers shall receive double time for Sundays and holidays.

All men employed making beads shall receive 50 cents an hour.

All foremen shall receive not less than 50 cents an hour.

All motorcycle tire builders, whether hand or machine men or finishers, shall receive the same as motor car tire men—55 cents an hour.

All girls working in rubber factories working at flat rates and no piecework shall receive not less than \$14 per week.

If working on a piecework basis they shall receive a 25 per cent increase over the standard piece in their respective departments in January, 1912.

Any and all departments not represented in the foregoing scale, either male or female employees—shall receive an increase of 25 per cent over standard price for piecework in January, 1912.

When the company is in any way at fault for employees not putting out required amount of work per hour, they shall receive the usual price per hour as when running full capacity.

All day work labor shall be rated at not less than 30 cents.

# Legislatures Take Up Motor Questions

**ALBANY, N. Y., March 9**—In a formal statement today Secretary of State Mitchell May outlines the changes in the present motor car law, which will be made if the various changes he is advocating are enacted by the legislature. This will result in the doubling of the license fees for passenger vehicles in the state and an even greater increase in the fees for trucks. These proposed increases are arousing a storm of opposition among manufacturers and owners, but Secretary May believes the increases bear such an insignificant part in the annual cost of maintenance that they are not worthy of the opposition they have aroused.

"The increase in the fee for cars under 25 horsepower from \$5 to \$10," Secretary May says, "means an increase in the cost of maintenance of less than 42 cents a month. The increase on commercial vehicles of 6 tons from \$5 to \$30 per year would mean an increase in the cost of maintenance of a trifle more than \$2 per month. No man contemplating the purchase of a car would give such additional cost the slightest consideration."

Some of the other features in the measure are:

The power of suspension or revocation of the license or certificate of registration, with or without hearing, is extended to the secretary of state; the secretary of state may refuse to register or license where an improper person applies. This will prevent a chauffeur who has lost his registration from obtaining a license as owner or part owner; any person under 18 years of age may operate a car if accompanied by a licensed chauffeur or owner over 18 who will assume responsibility; chauffeurs' license fees are reduced from \$5 to \$2, with renewals at 50 cents; the registration year is to correspond with the calendar year. Other regulations as to the transfer of license numbers are much the same as have been adopted in many states.

One of the provisions that has caused the most opposition is in the section permitting only persons authorized by law, such as registered owners, members of owner's families, in case the owner agrees to be responsible, and licensed chauffeurs to drive the car. This has been construed by some to mean that the owner of a car shall be primarily liable for any injury to persons or damage to property caused by his car, no matter who is driving it. In fact a bill to this effect has been introduced.

In defense of this, Secretary May states that there are more than 300,000 persons operating cars in the state who are not authorized to do so by virtue of the possession of owner's or chauffeur's license. He said further that 90 per cent of all the accidents that occur are due to persons other than owners or chauffeurs:

## NEW JERSEY'S RIDICULOUS BILL

Trenton, N. J., March 10—In the Bracken bill introduced by a member of the state assembly, the Jersey lawmaking artisans have reached the height of ridicule. The bill calls for 14-inch tire equip-

## New York, New Jersey, Wisconsin and Others Discuss Many Bills

ment all around on large freight motor cars or, according to the wording of the bill, 1 inch of tire to every 800 pounds of truck weight. Large passenger cars are to have six tires from 1 to 2 inches larger than the present sizes.

## MICHIGAN PASSES TAX BILL

Lansing, Mich., March 6—The state senate today passed the Allswede license law

## S. A. E. Rim Quiz Started

**CLEVELAND, O., March 12**—Special telegram — Following the regular March meeting of the council of the Society of Automobile Engineers, held at the Chamber of Commerce here this morning, at which, in addition to the regular routine business, it was decided to appoint a fuel committee to cooperate with the recently formed similar committee of the National Association of Automobile Manufacturers, the hearing before the pneumatic rim standardization division of the society was opened.

Cleveland was named as the rendezvous at the last annual meeting of the society. About thirty-five engineers and representatives of the rim makers were in attendance, while in addition to the members of the council the rim committee, consisting of Henry Souther, chairman; G. G. Behn, Hudson company; T. W. Guthrie, Standard Welding Co.; F. H. Moyer, Firestone company; W. C. State, Goodyear company; C. B. Whittlesey, Hartford Rubber Works; and C. B. Williams, Mott Wheel Works, were present. J. G. Vincent, Packard, and H. L. Barton, General Motors, were unable to attend.

The investigation was opened by the taking of testimony of representatives showing quick detachable rims as distinguished from the demountable types. There were four samples of strictly detachable rims. Each representative was questioned as to the weight of his type, whether it could be sold in competition, how it withstood service, method of operation, number of parts, its adaptability to wire wheels whether the standard dimensions of the Clincher Tire Association had been adhered to and whether it could be manufactured by any mill without special machinery.

At the morning session, three rim representatives were quizzed, these being W. L. Burgess, Firestone; O. W. Mott, Mott Wheel Works; and E. R. Hall, Goodyear. It is probable that the inquiry will extend over several days as the committee proposes to give full consideration to all.

which would impose a tax of 50 cents per horsepower on all motor cars, and removing motor vehicles from the jurisdiction of the local tax officers. It is proposed to have the money coming from this source go to the state highway fund. The income from such taxing would amount to some \$600,000 or \$800,000 per year, which could be very handily used for road improvement in the minds of the good roads enthusiasts.

## WISCONSIN'S FREAK BILL

Milwaukee, Wis., March 10—The latest freak measure Wisconsin motorists are facing at the hands of the Wisconsin legislature is the Richardson bill, which attempts to make certain that no motorist will exceed the speed limit by requiring all motor cars sold in Wisconsin to be so geared that the maximum speed to be obtained from any car will not be more than 25 miles per hour.

The bill is regarded in a serious light by Wisconsin motorists, who fear that the principle may be put in practice in some way soon, although the Richardson bill is more of a joke than anything else. This bill does not apply to any motor car previously sold or owned in Wisconsin, whether its speed be 10 or 100 miles per hour, nor do its provisions apply to any motor car owned and operated by any non-resident of Wisconsin. However, it exempts physicians and police officers.

## TEXAS LEGISLATING

Austin, Tex., March 8—Prospects are favorable for the enactment by the state legislature of Texas of a bill creating a state highway department and establishing a state highway commission and the office of state highway engineer. The measure, of which Senators H. B. Terrell and H. L. Darwin are the authors, has been favorably reported by the committee on roads, bridges and ferries. It carries an appropriation of \$10,000 to pay the general running expenses of the proposed department up to and including January 31, 1914.

## OHIO BALKS AT TAX BILL

Columbus, O., March 10—Petitions are in circulation among the car owners of Ohio protesting against the bill pending in the Ohio general assembly which fixes registration fees upon the horsepower of motor car. It is the measure which is being fathered by Governor Cox, of Ohio, and recently a committee from the two state motor associations called upon him to protest. The petitions are being circulated to show the governor the feelings of the motorists.

## NEW YORK WANTS DATED TIRES

Albany, N. Y., March 11—The house today passed a bill requiring manufacturers of motor car tires to stamp the date of manufacture on each tire.



# New Angles on Motor Car Insurance

## Rates for 1913 Defined by Underwriters

**C**HICAGO, March 11—Lower rates of insurance on new models and higher rates on second-hand cars will result from the formation of the Western Automobile Underwriters Association in this city recently and an alliance with the Automobile Underwriters Conference, the parent body, to be effected soon. With the new organization established as a subsidiary body to the conference, the eastern schedule of rates will be adopted and the owner of a new motor car will have an opportunity to profit by the contemplated amalgamation.

The announcement of the prospective adoption of a new schedule in this territory may be regarded as "a word to the wise." The owner of a 1913 model will find it to his advantage to forego taking out a policy until the alliance is effected. The motorist wishing to insure a second-hand car, on the other hand, will save money by doing business with an underwriter immediately.

### Present Western Schedule

The schedule of rates now in force in Chicago and the middle west do not differentiate between the new and the second-hand machine. For example, the owner of a 1913 model, listed at \$3,000, who wishes to insure against fire and theft for \$2,500, must pay a rate of 2½ per cent or an annual premium of \$62.50. The owner of a second-hand car, put on the market 2 years ago and selling then for \$3,000, wishing to insure for \$2,500, pays a rate of 3 per cent on \$1,500, 40 per cent being deducted from the desired amount of insurance for depreciation, or a yearly premium of \$45.

Under the eastern schedule, to be adopted with a few minor changes by agents in this district, the owner of the \$3,000 1913 model pays a rate of 2¼ per cent or a premium of \$56.25 on \$2,500, and the owner of the \$3,000 second-hand car, allowed to insure for \$1,500, pays a rate of 3½ per cent or a premium of \$52.50.

Thus, the owner of the new car can save \$6.25 on his premium and the owner of the second-hand car will lose \$7.50 by waiting until western underwriters adopt the eastern schedule.

The eastern schedule divides insurance into two classes: Class 1, "For cars in the hands of original owners, models known as 'this year' or 'next year', and cars, selling as high as \$6,500 and up and as low as \$3,500, built 1 year prior to the current year," and class 2, all second-hand cars.

The adoption of the eastern schedule will be to the best interests of the western underwriter. The insurance of new cars is the better investment for the insurance company, local agents claiming that 95

per cent of the losses are partial losses, money paid out for damages sustained by old machines. The present rates in force here are considered too low to insure even a small profit for the underwriter, and although the eastern schedule decreases the rate on the current year models, the increased rate on second-hand machines more than justifies the contemplated change.

There is a serious need for adjustment of rates and policies for motor car insurance in the middle west, according to local underwriters. With the exception of Chicago and environs there is little uniformity in this, the western department, extending from the Rocky mountains to Ohio. In no other territory is there such a diversion in rates and policies, with the possible elimination of the south, where the minimum amount of underwriting is done. The New England and middle departments are under the immediate jurisdiction of the conference, while agents on the Pacific coast and in Canada have established subsidiary organizations.

In Chicago there are approximately twenty-five companies that are members of the conference. Their agents write a policy similar to that in force in the east. These concerns are branches of companies originally organized in New York or vicinity and under the latter's jurisdiction. There are scores of smaller companies in the middle west, however, that have no affiliations with underwriters along the Atlantic seaboard, and in order to bring about some sort of uniformity in this section and include them in the conference, the western association was formed.

### Conference a Dictator

The conference is a dictator. It often issues orders that will not apply to conditions peculiar to the west, but, on the other hand, it is a power for the good of the average underwriter and so regarded by him. Local agents believe that the conference will consent to some compromises, eliminating minor inequalities in the eastern schedule, before the union is perfected. If such hopes are realized, the motor insurance business will be put on a more sound basis than ever before in the middle west.

"Conditions must be changed before underwriting motor cars fairly compensates the company for the risk taken," says A. T. Graham, secretary of the Western Automobile Underwriters' Association. "It is a popular but erroneous belief that we are making money out of motor car insurance; that the rates are too high; that the premiums paid by the motor car owner are swelling the dividends of insurance concerns; but statistics show that the margin of profit is very small.

"In the first place, the moral hazard is

great. If we could secure evidence we would be able to send some to prison for arson instead of paying them for cars destroyed by fire. It is not difficult, and sometimes very convenient, to have a car burn up. A lighted match applied to a gasoline tank on a lonely country road makes it possible for one who has insured his car against fire to realize on his investment. It is very seldom that we are able to prove that the fire was not accidental. If we believe that a car is destroyed for a purpose and fight the claim for insurance in court, we lay ourselves open to a suit for damages if the defendant proves his innocence.

### Easy to Lose a Car

"It is almost as easy to have a motor car stolen intentionally and just as difficult for us to collect evidence in theft cases as in fire cases. The insurance company makes every attempt to minimize its cost, but the fire and theft elements tend to increase the company's loss ratio to such an extent that the underwriting of motor cars cannot be termed a profitable business, at the present time at least."

Lloyds, the pioneer in the motor car insurance field, already has found that the profit accruing from this form of underwriting barely equals the risk taken. Seven years ago the English company issued a very liberal policy—covering losses from fire and theft, risks of navigation and transportation, collisions sustained, and third-party damage—which appealed very strongly to the motor car owner. The agents did not discriminate between machines owned for pleasure and machines operated for hire, with the result that the company lost money on collisions for which careless taxicab drivers and professional chauffeurs were in the majority of instances responsible, and ultimately abandoned that class of business. American underwriters learned a lesson at Lloyd's expense and now demand a much higher premium when insuring public vehicles.

Few car owners understand why they are required to pay a higher rate on an old car than on a new model, and feel that they are being held up when the agent, renewing a policy, increases the premium. The underwriter is justified in his demands, however, it is claimed. The decreased value of the car, if written at the same rate as a new car, would yield proportionately less premium, while the company's liability would be for a greater loss. The danger of partial loss on an old car is as great as if not greater than on a new car, and as the amount insured on an old car is less, the rate must be higher.

The average car owner knows about as much about his insurance policy as he does

about the Koran. He usually pays his premium, takes his policy from the agent and, without reading it, locks it up in his safe, believing that he is guarded against losses, and ultimately he discovers he is in error.

"Know thy policy" is a wise precept that is not usually kept by the motorist. Many an Iowa car owner is of the opinion that he is insured against third-party damage, but he is not. The public policy act of that state prohibits liability insurance, claiming that it induces careless driving and is a public menace. There are other motorists who think they are not liable for injuries sustained by persons run over and injured. The average policy does not cover such damage unless a sticker clause is attached and an extra premium paid.

## Talks on Fischer's Motor Detroit S. A. E. Listens to Report on Slide-Valve Engine Test

Detroit, Mich., March 7—A representative gathering of motor car experts was present at last night's meeting of the Detroit section of the Society of Automobile Engineers, which was the first to be held since December, the national shows having occupied the attention of the members during January and February.

The session was particularly interesting because of the presentation of the report of the test by the Automobile Club of America of the Martin Fischer slide-valve motor by Herbert Chase, the club's laboratory engineer. A paper in explanation of this non-poppet type, which is being introduced in this country by L. B. Brown and George Ractliffe under the name of the Magic motor, was read at the last meeting of the section, its unique crescent valve slides being the principal distinguishing feature, and Mr. Chase's report answered many of the questions which were left open from lack of data at that time.

Mr. Chase's report did not seek to compare the motor with other existing types of engines in any way, nor to offer any comment as to the results obtained. It was merely a presentation of the facts as obtained in the club's laboratory and to which the club was willing to give its official signature. The report was supplemented by lantern slides showing some of the special apparatus used for the test and the arrangement of the various apparatus, as well as curves plotted from the data obtained and manograph cards of both working and pump strokes. There was no special discussion of the results set forth in the report.

The second paper of the evening was read by Ferdinand Jehle, of the Commercial Engineering Laboratories, this city. Mr. Jehle's subject was: "Are Barometric, Temperature and Humidity Readings of Any Value in Comparative Motor Tests." Mr. Jehle did not attempt to answer the question, but merely wished to set the

facts before the engineers so as to bring out a discussion of the subject and possibly to cause some careful and scientific investigation to be made along this line in the near future. He took the stand that the ordinary variations in the temperature, barometer and relative humidity readings do not appreciably affect the practical comparative tests of motors, although there may be very slight differences due to them.

When one motor does not show up as well as another in test these atmospheric conditions are blamed for the poor showing, thus offering a loophole. Calculations were offered to show that even with the most extreme differences in atmospheric conditions, coupled with the maximum effects which they could cause, no such differences should be taken into consideration.

Mr. Jehle stated that the only way in which we can arrive at definite conclusions on this subject is run special tests with this particular end in view. "Some of us have cold rooms in which motor tests can be run," he said. "In these we could control the temperature and possibly the humidity. The pressure of the entering air might be controlled by a small blower. Such tests would be of real value. They would show better what differences atmospheric changes bring about than any calculation."

The general trend of the discussion which followed was toward the views held by Mr. Jehle, barometric changes due to altitude and humidity variations being taken up, principally in their effects upon carbureters. Frank H. Trego, research engineer of the Packard company, stated that he was about to start a 500-hour test and that he would be glad to get any suggestions from the members present as to what determinations or observations in addition to those ordinarily included in a test of this kind which would be of value. He sketched some curves made from data taken on a recent 351-hour test of a Packard motor running continuously at 1,200 r. p. m. with wide open throttle. Through one range of about 40 hours during this particular run, the weight of air per cubic foot diminished while the torque remained constant. This was offered as a proof that even with a varying humidity, the engine running was constant.

## OPTIMISTIC ABOUT COLUMBUS BUGGY

Columbus, O., March 10—According to the report of Appraisers Julius F. Stone, J. F. Hatcher and Paul T. Norton, named by the court to appraise the assets of the Columbus Buggy Co., now in the hands of Receiver McLaren, if the concern continues to operate under efficient management and is now thrown into forced sale, the corporation is solvent. The figures showed the assets to be valued at \$892,935.53, which is only about half of the valuation given for the assets at the time of the receivership, January 18. In ex-

plaining their report the appraisers say the valuation is believed to be fair if the concern is continued. In arriving at the valuation the gasoline cars were appraised at but 50 cents on the dollar because of the inevitable difficulty in disposing of the completed product.

## HOUPT OFF ALCO STAFF

New York, March 10—Harry S. Houpt has resigned as general sales manager of the motor car department of the American Locomotive Co. Mr. Houpt has not been in the best health for some time and he has left for a trip through the south. Much credit for the large increase in business is given to Mr. Houpt by the American Locomotive Co. officials. As a result of this good work an attempt was made to retain his services.

## Gasene Latest Discovery New Fuel Reported to Have Been Brought Out in East

Warren, Pa., March 7—Another substitute for gasoline which has wonderful possibilities as a fuel for motor cars has been discovered here, if the newspaper accounts are to be believed. It is called Gasene, but, according to the newspapers, will sell wholesale at 3 or 4 cents a gallon as against 18 cents for 68 gravity gasoline. With the ridiculously low price, it is claimed that a mileage 25 per cent greater than that with gasoline is obtained from each gallon of the new fuel.

Gasene is the discovery of Henry B. Taylor, an employee of the Cornplanter Refining Co. here. For the last 8 months, it is stated, the Cornplanter refinery has been experimenting with Taylor's formulae. It is reported that Taylor and the officials of the refinery find that 60 per cent of a barrel of crude oil can be converted into Gasene, as against 16 per cent of Gasene from the same quantity of crude.

According to officials of the company, the new fuel leaves no carbon deposit and can be used in any carburetor.

Coming so closely upon the heels of the recent announcement by Motor Age of the discovery of Motor Spirits, the announcement of Gasene is a coincidence in other ways. The latest gasoline substitute seems to be quite similar to Motor Spirits, so far as may be judged data the incomplete given out by its backers. The same advantage over gasoline in the matter of mileage is claimed for it, somewhere near the same per cent of distillate from the crude is said to be obtained and it seems to be similar in other respects. The most radical difference apparent at present is in the price. Whereas, Motor Spirits is offered at 3 cents less than gasoline, Gasene, according to the newspaper reports, is to be offered at 3 cents wholesale. This figure is regarded as too good to be true by oil men, who state that 3 or 4 cents is less than the price of the crude.



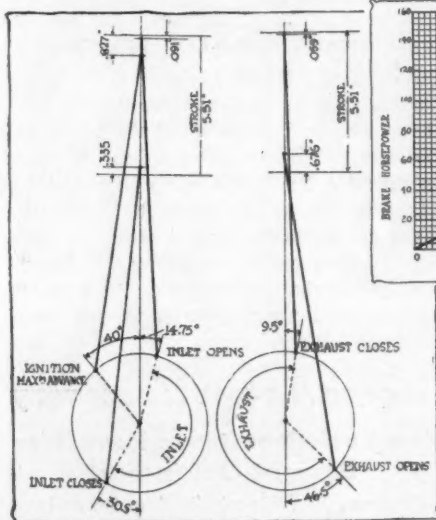


FIG. 1—TIMING OF TALBOT MOTOR

Diagram showing timing of ignition and valves on Talbot 25-horsepower motor that made new record for 1 hour run at Brooklands

### POWER LOST FROM LATE EXHAUST

### Relation of Power to the Time of Valve Opening Discussed

**C** HAFEEE, N. D.—Editor Motor Age—With an engine of 4-inch bore and 8-inch stroke, what per cent of the power would be lost if the exhaust valve opened when the piston is 4 inches from the top and closed as usual?

2—Also, at 5 inches. The engine to be normal in every other way.—Claude A. Phillips.

This cannot be answered accurately unless an indicator card of some particular motor is submitted. The method then is simple. Let us take the card of any engine, X, for example, which is represented in Fig. 3. If the exhaust valve opened at A, which represents a point when the piston is 4 inches from top center, then the area Y would represent the loss. If the valve opened when the piston was 5 inches from top center, as shown at Z, then the loss would be represented by the area M. If you name some particular motor perhaps Motor Age can get an indicator card and give you more accurate results.

## THE REGISTERING OF SPEEDOMETER

### Change of Wheel Size Necessitates Change of Speedometer Gear

St. Paul, Texas—Editor Motor Age—Where could I secure repair parts for the Craig-Toledo roadster, 1907 model, and what is the rated horsepower of this car?

2—If I put a 33 by 4-inch casing on a 32 by 3½-inch wheel, will it change the ratio of the gears, and will it decrease the power of the engine?

3—What was the horsepower of the Buick 39 touring car for 1911?

4—Will a speedometer on a 32 by 3½ register the same on a 33 by 4-inch wheel? What is the difference in per cent if any?—E. Reid

1—Motor Age does not know where repair parts may be obtained. The Craig-Toledo, 1907, was rated at 36 horsepower by the S. A. E. formula.

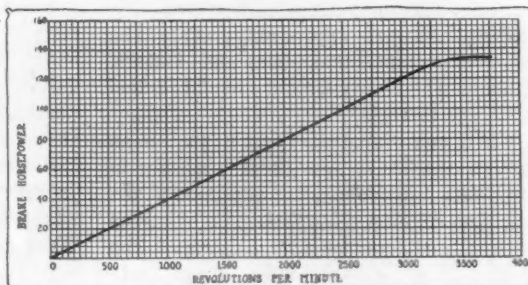


FIG. 2—BRAKE TEST OF TALBOT MOTOR  
Showing horsepower developed at different  
crankshaft speeds from 0 to 135 horsepower at  
3,500 revolutions per minute

2—Gear ratios are constant, but the total gear reduction is changed. That is, the ratio between the motor revolutions and the wheel revolutions is altered. The difference in tire size is so small as to be negligible in considering motor power.

3—32.4 horsepower, S. A. E.

4—No. As soon as the wheel size is changed the gearing of the speedometer must be changed. The Stewart speedometer driving gear has twice as many teeth as there are inches in the diameter of the wheel. That is, if the wheel is 32 inches the speedometer gear has 64 teeth. This ratio is used in all cases where Stewart instruments are used. However, not all speedometers are geared this way. In the case you mention the 32-inch tire would require a driving gear with 64 teeth, while the 33-inch tire would use a gear with 66 teeth, or a rise of 3.1 per cent in the number of teeth.

### K-W MAGNETO HEADLIGHT DATA

## Westerner Wants Information Regarding Magneto Operated Lamps

Sloux Falls, S. D.—Editor Motor Age—We noticed an advertisement of the new K-W magneto light for headlights. Can Motor Age give us any more information regarding this than is given in the advertisement?—Mannix Auto Co.

In Motor Age of January 30, pages 41 and 42, the wiring diagram as well as a view of the generator is given. Also data concerning the generator.

## WEIGHTS AND GEAR RATIOS OF CARS

### Information on Six Different Makes Given to Kansas Reader

Scandia, Kans.—Editor Motor Age—I would like to know the exact weight with full equipment of the following 1913 touring cars, also the gear ratio on direct drive: 25 Buick, Reo the Fifth, 69 T Overland, Marathon Runner, and Regal T.—A Subscriber.

This information is given in the following table:

CAR	WEIGHT	GEAR RATIO
Model 25 Buick.....	2350 pounds	4 to 1
Reo the Fifth.....	2650 pounds	.....
Model 69 T Overland..	2500 pounds	3½ to 1 & 3¼ to 1
Marathon Runner....	2200 pounds	4 to 1
Regal T .....	2300 pounds	3.7 to 1

## Communications and Questions Answered

Claude A. Phillips	Chaffee, N. D.
E. Reid	St. Paul, Minn.
Mannix Auto Co.	Sioux Falls, S. D.
A. Subscriber	Sioux Falls, Kan.
A. L. Sheridan	Indianapolis, Ind.
Claud Reeves	Grapple, Tex.
Oren D. Smart	Madison, Wis.
H. Skreberg	Milan, Minn.
Ole Thorsgard	Conrad, Ia.
Robert F. Buggs	Janesville, Wis.
A. E. Pugh	Baker, Mont.
A. T. E.	Madison, Wis.
E. H. Mahan	Liberty, Kan.
J. B. Halysin	St. Louis, Mo.
D. V.	Durham, Ont.
Daniel G. Braden	West Finley, Pa.
J. C. Jensen	Grand Rapids, Wis.
Gorden McColloch	New Boston, Tex.
Gordon McColloch	New Boston, Tex.
A. Darr	St. Louis, Mo.

### DETAILS OF HOUR-RECORD TALBOT

## Horsepower Chart and Valve and Ignition Timing Diagrams

Indianapolis, Ind.—Editor Motor Age—I note in the issue of Motor Age for February 27, page 20, in the article on the four-cylinder 101.5 by 140 millimeters—4 by 5½-inch—Talbot that did a flying ¼ mile at 112.28 miles per hour and 103.8 miles in 1 hour, that you state the engine speed was "in the neighborhood of 2,800 revolutions per minute," which would put 3,000 revolutions per minute at 112 miles per hour, just exactly what I figured it would be, judging from what I know of English practice.

Please tell me what size tires this Talbot had and what gear ratio.—A. L. Sheridan.

Motor Age for March 6 on page 15 gives some details of the Talbot and its performance. The wheels are 34.64 inches in diameter and the gear ratio—wheels to motor—is 2.43 to 1.

The Autocar, published in England, in its issue for February 22, gave some further details of the Talbot, which set a new record for 1-hour runs. The valve and ignition timing is illustrated in a chart which is reproduced in Fig. 1. The timing is shown in degrees of crankshaft revolution and also in inches of the piston travel.

In Fig 2 is shown the power curve of the 25-horsepower Talbot four-cylinder engine, with a bore of 4 inches and a stroke of  $5\frac{1}{2}$  inches. This is plotted from the results of a brake test of the motor and indicates a straight-line increase from 20-horsepower at 500 revolutions per minute to 120 horsepower at 3,000 revolutions per minute; that is, six times the power at six times the speed.

To average 105 miles per hour with a gear ratio of 2.43 to 1, and wheels 34.64 inches, the engine made 2,500 revolutions per minute—plus slip—with a gasoline consumption of 17 ton-miles per gallon. The horsepower at the average engine speed of 2,500 revolutions per minute was 100. The S. A. E. rating of this engine is 25.6.

Indicator diagrams of the engine show a maximum pressure in the cylinder of 650 pounds per square inch and a mean effective pressure of 120 pounds per square inch.

**RETARDED SPARK STOPS AN ENGINE****Motor Refuses to Start On Compression—  
Magnetos At Fault**

New Boston, Texas—Editor Motor Age—The magneto on a Buick 21 has been giving trouble. The car was taken to a garage to be overhauled and the magneto was in fine condition. Since it came out it will not run on magneto under 10 miles per hour, and this only when the spark is advanced three-quarters or over. The engine will stop at once if the spark is retarded. The batteries work well at any position of the spark. This engine will not start on compression when button is pressed. In place of starting it will backfire for eight or ten times.—Gordon McCulloch.

It seems probable that the trouble was due to carelessness on the part of the repairman. It is evident that in assembling the magneto was timed wrong or else the magnets were removed from their base too long so that they became partially demagnetized.

**STARTING A FORD IN ZERO WEATHER****Westerner Has Novel Way of Starting  
Frozen Motor Car**

Milan, Minn.—Editor Motor Age—The writer finding it next to impossible to crank a Ford car after its having stood over night in very cold weather, finally hit upon an easy way, and as it may prove of value to many, will tell the readers of Motor Age.

First, jack up both rear wheels to hang clear; second, place high speed lever in neutral position; third, set throttle in about sixth notch and flood the carburetor by opening the needle valve one or more turns, prime the cylinders by shutting the air intake in the carburetor, and if the plugs, etc., are correct the engine should start. After the engine has been allowed to run a couple of minutes, press the reverse pedal and this will cause oil between the clutch disks to release its hold and by letting down the rear wheels the car is ready to start off. The jacking up is good for tires and is quickly done and saves one from cranking his head off.—H. Skreberg.

**VIBRATOR SYSTEM NEEDS TIMER****Texan Claims That All Four Plugs Spark  
Simultaneously**

Graham, Texas—Editor Motor Age—I want to know why I cannot use a duplex single vibrator coil on my Maxwell Q instead of the non-vibrating coil. I have a Splitdorf magneto that gives me trouble. I get a small spark from all the plugs at the same time. If there

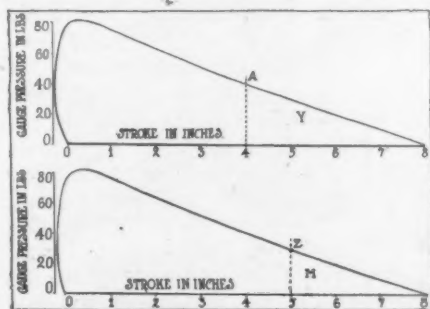


FIG. 3—HOW TO FIND EXHAUST LOSS  
Indicator cards of 8-inch stroke motor with  
exhaust opening at half-stroke

is a short circuit, where and how can I find it?—Claud Reeves.

1—If a vibrator coil is used in connection with the Maxwell Q ignition system it would require a timer. Nonvibrating systems do not require timers, while vibrating systems do.

2—The Maxwell Q is a four-cylinder model and there is only one possibility of all plugs sparking at once. If the distributor board is flooded with oil and has a deposit of carbon completely around it, then there is a dead short between all the segments and current going to one segment will travel to all.

This condition will cause a little spark to occur at the terminals of each plug at the same time. Because of the fact that such a condition is not apt to occur, Motor Age has been led to believe that you mean the two-cylinder opposed Maxwell, known as model AB. In this both plugs spark at once. There is no distributor, only a breaker being used. There is a spark in the cylinders on both the intake and exhaust strokes.

**SAYS TWO-CYCLE IS NOT EFFICIENT****Takes Exception to Statement in Motor  
Age and Offers Diagram**

Madison, Wis.—Editor Motor Age—In Motor Age for December 26, 1912, I found a statement reading thus: "Theoretically a two-cycle motor or an air-cooled motor, either will produce higher efficiency than the standard type, so that," etc.

The two-cycle is less efficient than the four-cycle engine. One reason for this is that both intake and exhaust ports are open during part of the operation, making it difficult to properly scavenge the cylinder. To prevent, as far as possible, the fresh gas from escaping directly to the exhaust, a baffle is placed on the piston. It is only by skillful proportioning of the pressure, port areas, and piston speed that large loss from this cause is avoided. The burned gases in the cylinder, it is sometimes claimed, form a barrier between the fresh entering gas and the exhaust port. Fig. 4 shows a two-cycle diagram with these points indicated.

The exhaust port is uncovered at D, and the pressure rapidly falls. At A, the inlet port opens, the fresh supply of gas holding up the pressure. From A, out to the end of the diagram and back to B, both ports are open. At B the inlet closes, and at E the exhaust port, when compression begins. Aside from the slight difference at D-A-B-C, the diagrams for the two-cycle and the four-cycle engines are precisely the same.

With a two-cycle engine, twice as many explosions occur as in a four-cycle, and for motors of the same size, the two-cycle will produce more power. However, it is done at the expense of more fuel and it can not be as efficient as the four-cycle, although it may be made to approach closely.—Orren D. Smart.

**METHOD OF SOLDERING ALUMINUM****Requires Skill as Well as a Special Form  
of Soldering Material**

Conrad, Ia.—Editor Motor Age—I would like a receipt for soldering aluminum.—Ole Thorsrud.

Unlike other substances, aluminum is difficult to solder. The reason for this is that on every aluminum surface there is a deposit of aluminum oxide. This oxide forms very rapidly. If a piece of aluminum were to be heated and then allowed to cool, the oxide would begin to form immediately after the metal were taken from the forge. No solder has been made that will adhere to aluminum oxide. So it remains to get rid of the oxide and at the same time apply the solder. The method is known as tinning.

For this is necessary a piece of commercial aluminum solder. This may be obtained at any supply store. The Chicago Auto Supply Co., Chicago, is a firm which handles such solder, which requires no flux. The two pieces of aluminum to be soldered are heated first to a red heat. While in this condition some of the solder should be rubbed on the surface and stirred with a metal rod. The reason for this is that in stirring the oxide is scraped off to some extent.

The stirring continues until the solder has almost solidified. With this thin coating of solder on the surfaces there is no chance for aluminum oxide forming. If the aluminum were not first tinned then aluminum oxide would form on the surface, making soldering impossible. With the surfaces tinned the operation is just the same as if the metal were copper. A soldering iron and torch are used usually for this purpose.

**FORD BRAKES NEED RELINING****Adjustments Fail to Make Reverse Oper-  
ate Properly**

Elgin, Ia.—Editor Motor Age—Kindly tell me what to do with the foot brake and reverse bands that grip too severely on a Ford model T touring car. I have tried different adjustments without avail.—A Reader.

In all probability the lining on the bands is worn, and in order to have the brakes and reverse work properly relining is necessary. The Ford company supplies material for this purpose at nominal cost to owners.

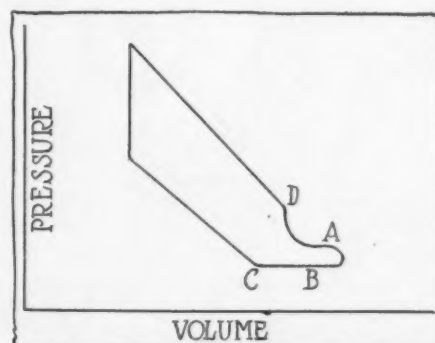


FIG. 4—CARD FROM TWO-CYCLE ENGINE  
Points of operation of intake and exhaust  
valves shown on indicator card



## SQUARING OF PISTONS IS DEFINED

### One Method of Lining Connecting Rods Is Illustrated

Janesville, Wis.—Editor Motor Age—What is the real meaning of squaring the pistons and lining up the connecting rods before putting on a set of block cylinders. Is there any danger of springing connecting rods when putting on a set of cylinders by hand and one end should be a trifle lower than the other or the weight of the cylinders left on the two pistons for a few moments while the man steadying the cylinders happened to take a rest.

2—Is there any necessity for squaring up the pistons when the wrist pins provide play for the movement of the pistons.—Robert F. Buggs.

1—Piston squaring and connecting rod lining are important factors in motor assembly. Each factory employs its methods of doing these things; the difference being usually in the construction of the liners. In Fig. 6 is shown the apparatus in place.

Connecting rods usually are drop-forged, and drop-forgings are bent easily. A square, S, Fig. 6, is used to determine whether the connecting rod is straight. If the side of the square does not touch the connecting rod, C, at every point, then the rod is bent, so that it will be parallel with the side of the square. This is done with each connecting rod.

Piston squaring is accomplished usually by the use of the jig shown in Fig. 6. It is a three-sided tool with the base plates, B, perfectly flat. The flange, M, is triangular in shape and the sharp edge is made to touch the piston, P. Squaring is done as follows:

The motor is cranked until two pistons are up as far as possible. The jig is then slipped over one of the pistons as shown in the illustration. The center mark of the flange should be lined up with the center of the connecting rod as shown by the dotted line. When this has been done the piston is in the position it occupies when in operation. The distances A and B should be equal. If they are not then the connecting rod should be bent until they are and the rod again lined up. The operation continues until the rod is straight and the distances A and B equal. The bottom of the flange must be flush against the top of the piston. If any space appears between the two then the piston is not square. The connecting rod is then bent until the piston is straight. The rod is bent back and forth very easily with a tool designed for the purpose.

The difficulty of the job is in getting a condition that will make A and B equal and at the same time keep the rod straight and the piston flush against the bottom of the flange.

2—Yes; connecting rods are usually drop-forged and bend very easily. Any undue pressure sideways may spring them. It is safe to prevent, as far as possible, the casting resting upon the pistons.

3—Yes; the side-play of the

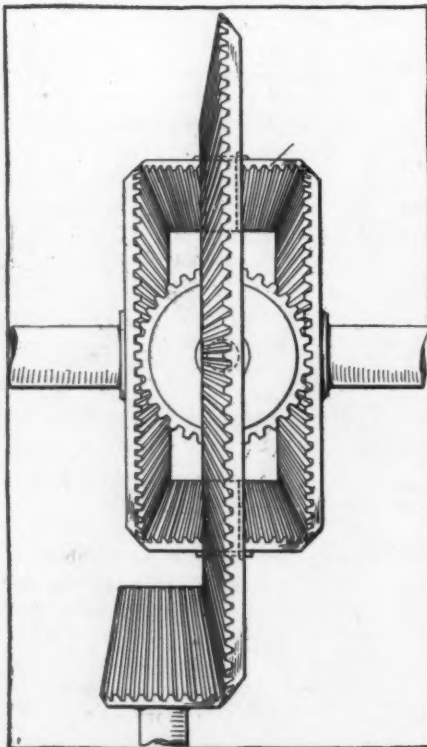


FIG. 5 — DIFFERENTIAL ASSEMBLED SHOWING RELATION OF PARTS

piston should be the same on both sides. If the pistons were not squared, then they may later operate at an angle with the connecting rod. That is, one side of the piston might be high and the other side low.

## INVENTOR OF THE GAS MOTOR CAR

### Action of the Differential Gear Asked for by Westerner

Baker, Mont.—Editor Motor Age—Who invented the first motor car?

2—How does the drive and differential of the average car work?—A. E. Pugh.

1—George B. Selden invented the combination of the gasoline motor with the car, and the patent was granted in November, 1895; but steam wagons were in use abroad as far back as 1831.

2—Figs. 5 and 6 show the parts of the ordinary differential. A spider has mounted upon it four pinions. Sometimes two pinions or three are used. The spider with the pinions fits into the big bevel gear, P, as shown at A. On either side of the four

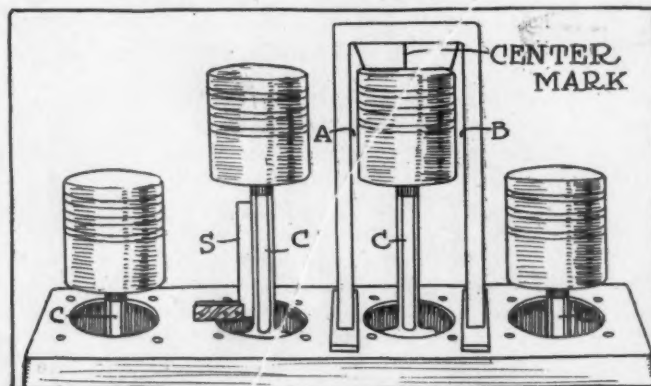


FIG. 6 — ONE METHOD OF LINING UP PISTONS AND CONNECTING RODS OF BLOCK MOTOR

pinions are two bevels. The axle shafts fit into the squared ends of these bevels.

When the wheels are on the ground and the weight of the car on the wheels the spider remains still. The pinions are also still and the entire differential revolves, but the only gear that really moves is the big driven bevel. That is, the pinions move but do not revolve upon their individual axes.

One wheel may go backward and other forward. In this case the pinions revolve upon their axes. The bevels into which the axle shafts fit may go in opposite directions. This is best illustrated by putting a spool between the palms of the hands and rubbing the hands. One hand goes one way and the other the other. The spool which is between the two also revolves. One hand may be held still and the other moved. In this case the spool revolves also. A motor car's rear wheels may do the same thing. That is, one remain still while the other revolves, due to the differential action.

## TEETH ON SPEEDOMETER GEAR

### Stewart Pinion Gear Size Given—Misuse Causes Inaccuracy

Liberty, Kas.—Editor Motor Age—Can Motor Age tell me what size the gear wheel should be for a Stewart speedometer for a 32-inch wheel. I have one on my car that was put on after the car left the factory. It does not register enough either in speed or mileage.—E. H. Mahan.

Sixty-four teeth should be on the gear. The number of teeth on the driving gear of a Stewart speedometer is always twice the diameter of the wheel. That is, for a 34-inch wheel, the gear would have sixty-eight teeth, a 36 would have seventy-two teeth, etc. The Stewart factory is the place to send your instrument if it is not working properly.

## KEROSENE FOR USE AS MOTOR FUEL

### Pros and Cons of Left Drive Elucidated for Wisconsin Man

Madison, Wis.—Editor Motor Age—Will kerosene be as efficient as gasoline for propelling cars?

2—What are the advantages and disadvantages of the left-hand drive? Why does not right-hand serve as well?

3—Is the G. and A. carburetor satisfactory on all types of motors? Is it satisfactory on aeroplanes?—A. T. E.

1—Yes, if a carburetor of suitable design is invented.

2—The chief advantage of left drive is that in stopping near the curb the driver may alight without walking around the car. Should the street be muddy, he must of necessity wade through the mud. Another is, that center control may be had that is operative with the right hand.

One disadvantage is in being unable to judge the distance between the car and another going in the same direction, when you wish to pass that car. In passing a car the rule is, drive to the left and if this is done you cannot see how far you are from the car you

are passing and hence must go a little out of the way or a little too close.

Right drive is ideal if center control is not desired, and if there is sufficient room between the steering column and side door to get through in order to alight.

3—G. & A. carbureters are made in a number of models each adaptable to certain motors. A G. & A. carbureter is made that has been used on aeroplanes.

#### MOTOR MISSES ON ACCELERATING Magneto Trouble Due to Dirt the Probable Cause in This Case

ST. LOUIS, Mo.—Editor Motor Age—I find that my car misses when accelerating, and think the trouble is in the magneto. On switching to the battery it runs smoothly. Have been told this is caused by grease getting into the magneto, but would like your advice on the subject.—J. B. Halysin.

If you have a system with a double distributor, that is, a distributor for the battery circuit and another for the magneto circuit, the trouble may be looked for in a number of places. First, see if the distributor board is not gummed. Also that not too much oil is on the face. The breaker points should be inspected. When the points become covered with dirt missing will be the result.

A few drops of kerosene on the breaker points sometimes clears up the mystery. Perhaps the points are out of adjustment. Find out from the maker of the magneto what distance apart the points should be. Grease on the breaker points or on one or more of the segments of the distributor may cause a miss. It seems as though the trouble is with the magneto and attention should be centered about it.

#### VALVE STEM ON FORD IS BENT Canadian Owner Cannot Account for Distorted Part.

Durham, Ont., Can.—Editor Motor Age—What possible combination of circumstances would cause the valve stem of a Ford motor car engine to bend in actual operation? What has happened here and the proper answer, mechanical or otherwise, bothers us.—D. V.

Fig. 7 shows what may have happened in the Ford motor. The valve may have been loose in the guide and then, due to insufficient oiling, become exceedingly hot. The push rod tends to force the valve upward in a straight line, but the valve, being loose, may have operated at an angle. The heat caused the valve to bind at the place shown by the arrow. A hot valve stem operating under the conditions mentioned invariably will bend. Motor Age suggests that you look for play between the valve and guide, and watch valve stem lubrication.

#### KEROSENE AS FUEL FOR THE CAR Man From Missouri Wants to Be Shown Gasoline Substitute.

St. Louis, Mo.—Editor Motor Age—How long will gasoline last at the present rate of consumption; and, should the supply give out, what could be used beside alcohol as an economical substitute?

2—Will kerosene vaporize the same as gasoline?

3—Could a Diesel engine be used to propel a motor car?—A. Darr.

1—It is impossible to state. New deposits of crude are found frequently. Motor Spirits has just been announced by the

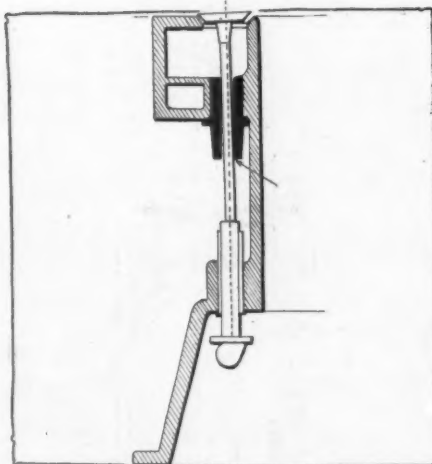


FIG. 7—HOW FORD VALVE-STEM MAY HAVE BEEN BENT

Standard Oil Co. as a suitable substitute for gasoline, particularly on trucks and tractors. The new fuel is cheaper than gasoline. Its production increases the supply of motor fuel from a quantity of crude.

2—Kerosene will not vaporize as readily as gasoline; it requires more heat.

3—It is possible, but as yet is not practical, on account of its great weight per horsepower.

#### OVERTAKE ON LEFT AMERICAN LAW New Yorker Gives Advice on Starting Car in Cold

West Finley, Pa.—Editor Motor Age—Will Motor Age please give me the road law and rules of the road for motor cars in Pennsylvania; also West Virginia and Ohio?

2—If any motorists having cars with multiple disk clutch are having trouble with starting these cold mornings, owing to the clutch sticking, if they will try jacking up one of the rear wheels, they will find their motor will crank a great deal easier. They will need to loosen the brakes, and therefore it

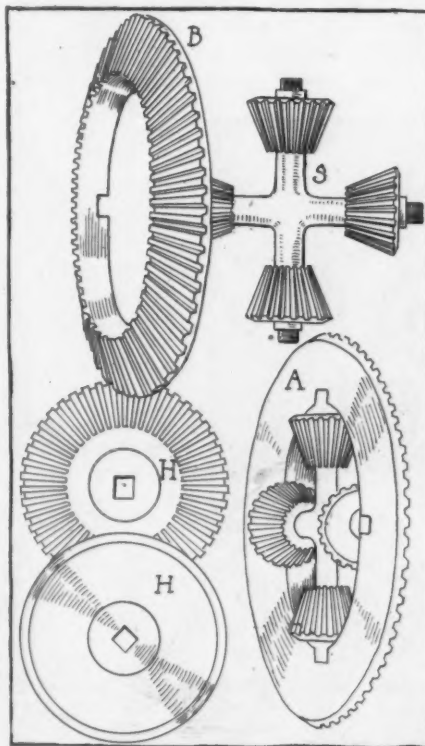


FIG. 8—PARTS OF THE ORDINARY DIFFERENTIAL GEAR

might be well to block the other rear wheel to keep the car from moving. Then when the motor has warmed up, it can be stopped, the wheel let down and the motor easily will start again.—Daniel G. Braden.

1—In every state in the Union the road law is, in passing a vehicle going in the same direction drive to the left. In passing an approaching vehicle pass to the right. In other words, in overtaking steer left, in approaching steer right.

The speed limit in Pennsylvania is 12 miles per hour in cities and villages, 24 miles per hour elsewhere. Front and rear number plates must be illuminated. In Ohio, the speed limit is 8 miles per hour in built-up sections, 15 in cities and towns and 20 elsewhere. Ten miles per hour is the speed limit in built-up sections of West Virginia, 15 in cities and towns and 20 elsewhere.

#### ELECTROMAGNET DATA WANTED Advice on Magnet Charging Apparatus—Method of Operation

Grand Rapids, Wis.—Editor Motor Age—I noticed on page 52 of the February 13 issue of Motor Age an article on recharging magnetos. I would like to get a little more information on this subject, as we have considerable trouble with magnetos, such as the older type of Remy, losing their magnetism after a year or 2 of service.

In Fig. 1 in A is shown a magnet in contact with two electromagnets. This magnet I presume does not go through the electromagnets but simply makes contact on end of the electromagnets. How are the electromagnets made? From what size wire and how many dry batteries are necessary to magnetize an ordinary magneto? Also, in B and C, what pole, if only one should be drawn across the electromagnet?—J. C. Jensen.

In February 13 issue of Motor Age, page 52, is shown one method only of recharging magnetos. It is sometimes called the brushing method. The magnets are simply drawn across the surface of the electromagnets. There are a number of methods of recharging, one in which the magnet poles are inserted into the coils and made to rest against the cores. In B and C the side view is shown. Only one coil is visible, but one pole of the magnet makes contact with one core and the other pole of the magnet with the other core.

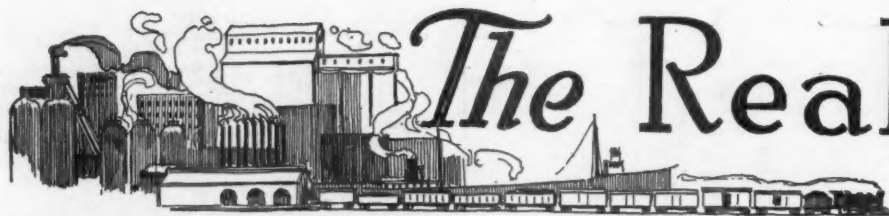
A method for making an electromagnet is described in Motor Age, issue of February 20, page 35.

#### BUICK HAS CRACKED CYLINDERS Freezing of Jacket Water Causes Cylinder to Burst Open

New Boston, Texas.—Editor Motor Age—I have model 21 Buick, on which the water jackets are cracked by freezing. As the job of welding will cost me as much as new castings, will ask Motor Age to advise me if the cylinders can be soldered or repaired in any other manner except by welding to stand ordinary hard service.—Gordon McCollough.

There is but one effective way of repairing a cracked cylinder and that is by welding with an oxy-acetylene blowpipe, or some other welding machine. A temporary repair may be made by rusting the crack. One handful of sal-ammoniac mixed with the jacket water will cause the inner wall of the latter to rust. A great part of the rust will settle around the crack, thus sealing it. However, cylinder replacement is considered by some the cheapest method in the long run.





# The Realm of the

## Motor Truck Drivers One of Problems

THE motor truck driver is a problem. In many lines of work where motor trucks are new it is necessary, in order to handle the routes and business efficiently and get service at freight yards and boat terminals, to use as drivers of expensive motor vehicles graduate horse teamsters. These know the routine of the day's work, are hail-fellows-well-met with the dock and yard men, and hence can get favors impossible to a new man. They are more valuable to the firm through this very fact than is the loss to the machine, due to any improper handling on the road.

Many teamsters make good in driving motor trucks. Some do not, and it is not always the best teamster who makes the best motor vehicle driver. As a rule a young teamster will make a better truck driver than an older man, as he is not so infused with horse-pace methods, and can more easily become enthused over motors.

### Influenced by the Horse

There is no doubt but that the proverbial laziness of the trucking teamster is due to the influence of the horse on the man's mind. The horse is supposed to be working, say 8 hours a day. If it travels for 4 hours a day at 4 miles an hour it has reached its limit of endurance for that day. Hence it is absolutely imperative that the horse stand still for half of his working day. That means that the teamster must stand still also. During part of this time the man will be working at loading and unloading, but if in a unionized city even then his responsibility will

cease with the delivery of the load off the tailgate, so that the work, except for a few moments, is very light. The man must spend perhaps 3 hours of his day loafing as a requirement of his horses.

This has influenced movements at loading points, such as railway freight yards, for a man knowing that he has 2 hours in which to get his load off, will not hurry but will take his time, stop to talk to fellow teamsters, and in general kill whatever initiative and snap there originally was to his mentality in a short time. It is this mental lassitude that leads to the saloon noon hours, and to other evils common to teamsters.

As has been stated, a young man in graduating from a horse team to a motor truck has more chance to make good than an older person, for his mentality has not been so long subjected to the influence of horse-pace. A man's mind is like his muscles, and, if trained, can act very quickly. If allowed merely to exist the muscles become flabby and slow; if allowed merely to dream in the slow and deliberate occupations, the mind becomes slow and cannot act quickly except by going through a system of mental gymnastics and training which can bring it up to standard again, as a pugilist is helped to come back in a muscular way.

### Chance for Young Man

If a man is young and not long in his lazy habits he can come back; if he is old he cannot regain mental capacity so easily, if at all.

Put the young man on the motor vehicle and he feels at once that here is something with go to it. He does not need to stand still for half of his day loafing, but has a chance

to do better than ever before. The average lazy man is not lazy through desire, or slow through intent, but because his work has made him so. The new work being a change the driver begins to see things in a new light. His mind, without his knowing or intending, quickens from day to day, and becomes more alert as the demands of the service he is in gives it practice, until in a few months the former teamster of questionably successful future has become a brighter, more alert man, worth more to himself and more to his employer. It is easy to see why the change will come to the younger man before the older.

### Examples Cited

Examples of horse-pace influence on teamsters were recently cited in connection with freight yard conditions in Chicago, where it was found that teamsters deliberately chose doors to unload where several wagons were ahead of them, so that they would have time to loaf while the others unloaded. This was not because the men were lazy in the first place, but to limit the wagons to three trips a day—the limit of mileage the horses could do. At the same time, having done this continually, the men had become lazy.

At one freight yard just off a main route of street travel it was found that teams bound for other points stopped, backed up to a blank wall as if waiting a turn, and there stayed while the driver had a nap. When he awoke he would drive on. This happened often.

At another point on a wagon freight route there was a railway bridge under which it was dark. Traffic in this tunnel always was congested from 12 to 2:30 on account of the number of wagons standing in the street with the drivers sleeping on the seat or on the load. Another bridge in another locality was noticed under which at least one wagon might be found almost any time of day with the driver asleep. There was room for but one or two wagons at this point at a time so when a two-horse rig came in and the



# Commercial Car



## That Face Business World Right Now

driver wanted a rest the driver in front moved on. This seemed to be an understood rule among drivers on this route.

To rail at the teamsters for these conditions will do no good, nor is it necessary. The condition is the result of the horse, and with the coming of the motor truck—which will be complete in a very few years—these very men will, in all probability, become alert motor truck drivers, who would not think of sleeping on the job from start to finish of a day's work. Those men who have been so enervated by the loose habits and harmful ways of living, induced by their surroundings, that they cannot come back will be eliminated of course, but the motor truck offers great opportunity for the greater part of the teamsters now on horse work to amount to something better.

It has been said that the electric vehicle had great advantages over the gasoline car on account of the lessened driver problem. This, no doubt, is true on the large-sized trucks, but the writer has noticed that the drivers of electrics, as a rule, are a higher class of men than on gas trucks, and for this reason:

### Difference in Drivers

The average electric delivery vehicle is a small car and is used in house-to-house work, and lines where the driver comes into contact with other people besides his fellows, meeting folks who must be handled diplomatically, and being required in the very nature of his business to exercise a certain amount of self control. These men have been surrounded by different influences in past horse work, and when they have taken charge of electric cars have taken to the new work naturally, for there has been little change in the spirit of the work. Even with horses in package work these men have learned the value of time saved in each delivery, as in house-to-house work speed always has been an item. With the motor vehicle they have but little new to learn.

A certain driver for a Chicago department store was complimented on some very

ingenious devices he had in use in his car for saving time in sorting packages and the like. They showed a deal of cleverness and that the man was interested in his work. He had been driving the car less than a year. Asked how long he had used the devices, he said, "Oh, I've used these same ones for 3 years." He had had the hurry spirit long before he took hold of the motor vehicle.

### Mechanical Knowledge of Men

Not all drivers, even of motor vehicles, use the greatest degree of intelligence in handling the vehicles in charge. Their mechanical knowledge often is limited and through this reason, or by intent or other circumstances, injury is done.

A few days ago the writer saw a disabled 1-ton truck on pneumatic tires, which had jammed one wheel in some way, being towed along the street by a second machine, the almost new rear pneumatic dragging on the asphalt with a whistling sound that could be heard for a block as the rear wheel refused to turn. The driver thought the music was a great joke. The cost would not be out of his pocket.

At another time a 1-ton truck was seen coming up to a crowded corner at a pace too generous for crowded thoroughfares. The driver was evidently in a hurry, but just as he reached the crossing the corner policeman blew the whistle. With a quick movement the driver threw the brake on full, sliding both rear wheels and almost throwing the occupants over the dash. From a 20-mile-an-hour pace to a dead stop took about 25 feet. The result on the tires can be imagined.

Oftentimes drivers meet with trouble through faults in the ve-

hicle. An inclosed body motor truck in Chicago was so arranged that the driver had a poor view to the rear and could see nothing on his left without leaning out from the car and losing sight of the load in front. On starting to turn to the left at a crossing he did not see a car on his left and ran into it. No damage was done, but if there had been a serious accident the truck driver would have been blamed. A mirror in front would have saved the accident.

This shows the new hustling spirit of the drivers of motor vehicles:

One was at the freight station of the Laks Shore railway in Chicago. Here all the freight doors were filled when an electric vehicle for the Commonwealth-Edison Co. drove in. Just ahead was a one-horse wagon containing a small box to be delivered, this wagon having waited in line one-half hour. The box on the electric was larger than that on the horse wagon and had to be taken to a further door. The driver, however, got off his machine and packed the box on his back for 200 feet to save the time of waiting.

### Driver Shows Forethought

At an Illinois Central freight door a two-horse wagon was unloading and another waiting. A 3-ton motor truck came up with a part load. Instead of waiting the driver backed in diagonally and, by stepping over a gap between the floor and the tailboard of his car, got his load off without waiting.

At a Chicago department store recently





a new method of loading was tried out. The order came from the office. The originator of the plan evidently had not been down to the alley where the loading was done or no such order would have been issued. To do the loading all of the furniture for the car had to be carried through the furniture salesrooms, while once at the ground floor during the motor truck loading the entrances to two alleys were blocked. It was the driver of the motor vehicle who did the most fuming, the loaders taking everything as a matter of course. The driver had a sense of responsibility that he couldn't hold back even at the risk of losing his job. The new loading method was dropped after a day's trial.

#### Help Business Deliveries

The commercial motor vehicle is going to help business deliveries but more than that it is going to breed a better class of men.

A certain Chicago firm operating a system which includes both package delivery and the hiring out of motor trucks by the day has devised a co-operative scheme whereby drivers actually own stock in the concern and hence take an interest in making every department work efficiently for a maximum dividend. The scheme, roughly, is this:

Drivers who would learn the business are first put into the shop and trained in the mechanical part of a motor truck's operation and repair. Here they work in a well-equipped shop under competent direction and become more or less skilled mechanics until the management judges them proficient enough to go higher. They are then put on a motor truck with an experienced driver and, to quote the words of the manager, "taught our system of driving a truck." This driver is a member of the company and when he judges

## Packard '14 Model Out

DETROIT, Mich., March 7—The Packard Motor Car Co. has announced its 1914 model 48, six-cylinder type, deliveries to dealers for demonstration purposes commencing next week. The new model combines the essential features of the 1913 model 48, although it includes left-hand drive, centralized control on the steering column and Delco combination lighting and cranking. These features were first incorporated in Packards with the coming of the little six, model 38, last fall.

The prices remain unchanged, although several new body types are offered, namely, the phaeton runabout, the salon type limousines and the cabette. Mechanically no changes have been made in the motor other than those necessitated by the shifting of the drive and control to the left side. The bore and stroke are  $4\frac{1}{2}$  by  $5\frac{1}{2}$  inches, respectively, and the rated horsepower 48.

In the general design of the chassis nothing new appears, the two-unit principle being retained; that is, the motor and clutch comprise the front unit, while the gearset, differential and final drive compose the rear transmission unit. The gearbox bolts to the rear axle and there are three forward speeds.

Packard dark blue still holds as the standard coloring, while wheels of open models are cream yellow, black striped. Closed cars have dark blue wheels. Several refinements are noticed in the bodies, such as the tonneau light affixed to the rear of the front seats of open models to facilitate entering and leaving the rear compartment.

the man to be good enough to admit to the organization turns in a report to that effect.

The student then files an application to join the company and be admitted to the stock-sharing proposition. The drivers who already are members get together in meeting and the new name or names are brought up and discussed. If the new men are provedly good men, honest, tactful, careful drivers, and of a high enough standard to be worth something to the organization the vote admits. If not, they go back to further training.

Once passed favorably upon the organization determines among itself the amount of stock which the new men may acquire, depending on proficiency as previously shown. This amount may run from \$100 to \$300 or more, and the amount a man will be allowed to buy is determined for him. Once admitted his pay is increased, but the amount of increase is withheld each week from his pay and applied to pay for the stock which has been allotted to him. When it is fully paid up it is issued to him, and he is a part owner of the business.

#### Scheme Commendable One

The scheme on the face of it has much to commend it, but a great deal of its value, if not all, will depend on the business judgment and integrity shown in its working out.

If a driver is out with a motor truck driving for an employer in whom he is not interested he will not take any extra precautions to give the customers he meets extra service and courtesies. If a scheme can be evolved which will give the driver a satisfactory interest in his work, and a dividend on his extra effort he will be a deal more proficient and efficient not only in his personal work and conduct, but in his handling of the vehicle which he is handling.

## City of Paris Abolishes Horses from Municipal Service

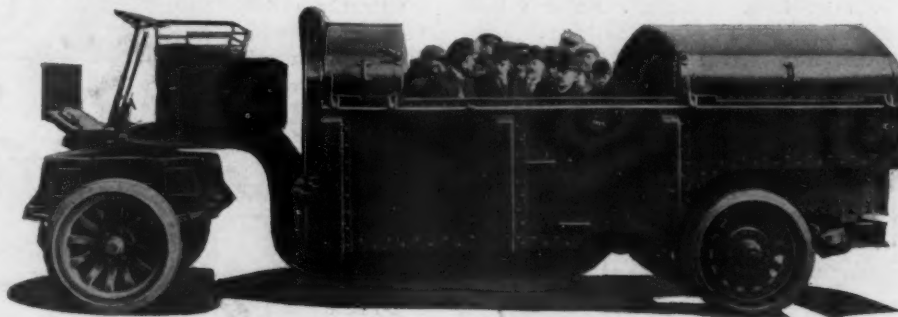
HAVING decided to abolish horses in all the municipal services, the Paris municipal council has just put into commission a large fleet of combined sweepers and water wagons. Last year a comparative test of various types of machines supplied by different factories was undertaken by the street-cleaning department, and it was found that a combination machine gave the best all-around results. Big-capacity water wagons having a powerful spray will be used for watering main avenues, but the bulk of the work will be performed by machines having sprinklers in front and a rotary brush under the rear. The latest fleet has been supplied by the de Dion-Bouton company and have four-cylinder, 12-horsepower motors in front and a large capacity water tank on the rear platform. The rotary sprinklers are set out in front of the machine and the gear-driven brush is mounted diagonally under the rear of the vehicle.

The house-to-house collection of refuse has given the street-cleaning authorities a considerable amount of trouble. At present this work is being carried out in most districts in a very unsatisfactory manner by the use of horse teams. After numerous experiments it has been decided to adopt a type of front-drive electric to which is attached an under-

slung frame carrying a big tank body hinged at the rear and held down by clips in front. The body has a roof in four sections, the two end ones being fixed and the two middle ones sliding. This allows the refuse to be dumped into the wagon with very little danger of it being blown about.

Gasoline vehicles have been tried for this work, but although the difficulty of getting a front-driver and steerer with a big-capacity low body has been overcome, the difficulty of

slow and economical running could not be solved in a satisfactory manner. As household bins have to be collected at intervals of a few yards, the rate of progress cannot exceed a mile an hour, thus entailing an excessive cost for fuel. Recharging rates are so high in Paris that the electric vehicle is very rarely used for commercial purposes, but notwithstanding this the electric has an advantage over the gasoline truck for this class of work, it is claimed.



A new type of vehicle adopted by the city of Paris for collecting household refuse. The top is in two fixed and two sliding sections. The metal body is hinged at the rear for rapid unloading



# The Motorist's Kindergarten



**EDITOR'S NOTE**—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car. The first article appeared October 10, 1912.

**E**LECTRICITY may be made in two forms—direct current and alternating current. The storage battery and other chemical generators of electricity give direct current. With few exceptions the magnetos of motor cars generate alternating current. The reason alternating current is preferred to direct current is because it is more easily obtained and more easily raised in voltage. In a previous article it was stated that the rapid interruptions of the current caused the high-tension current to be induced in the secondary winding of the spark coil.

With alternating current, because of its properties, the voltage is more easily raised. Just how the magneto generates an alternating current is explained in the following:

In Fig. 43, in the center, a horseshoe magnet has between its poles a coil of wire, which is wound around a shaft. The coil is represented in the figure by one turn of wire. As the shaft revolves a current is induced in the coil, or as it is called—armature. It has been found that when a coil of wire is revolved in a magnetic field a current is set up in it. The coil and core is called the armature. It will be seen that H1 of the armature is at the north pole of the magnet and H2 at the south pole. When this is the case a current is generated in the wire AB,

## Making Magneto Current

which flows from A to B as shown by the arrows. However, when the armature revolves 180 degrees H2 is at the north pole and H1 at the south pole, as shown in illustration at the right of Fig. 43. In this case the current flows from B to A as shown by the arrows. In other words, every time the armature revolves 180 degrees the current induced in the wire goes in the opposite direction. To determine the direction of the current in the coil place the closed right hand against the magneto with the thumb pointing toward the north pole of the magnet. Then the other fingers point in the direction of the current in the coil.

If the armature revolves very rapidly it is evident that a current will be set up in it which consists of a series of impulses, one in one direction and the other in the other direction. Current which continually flows back and forth in the same wire is known as alternating current. That is, it alternates, first going one way and then the other, but very rapidly. The rapidity with which the current flows back and forth is known as the frequency of the current. We often hear said that a current is of sixty cycles frequency, which means that the current goes back and forth sixty times in a second. The magneto generates a low-frequency current.

That is, the back-and-forth-motions of the current do not occur very often in a second.

In Fig. 43, at the left, is shown the magneto and connections to the spark coil. The fundamental principles of this machine will be discussed. The armature, A, is wound around the shaft. One end of the winding is attached to the shaft itself while the other is led out to supply current to the circuit.

The current generated in the armature as it revolves in the magnetic field is passed to a metal ring. A carbon brush rubbing against the ring takes the current and transfers it to a wire which in turn goes to the spark coil. In the coil the voltage of the current is raised. After leaving the coil the high-tension current travels to the distributor arm of the magneto, as shown by the arrows in illustration at the left of Fig. 43. The distributor arm is on a shaft and the shaft geared to the magneto gear. In this way the arm is made to revolve. The high-tension current which is passed to the distributor arm is given up to the segments of the distributor.

It was said that the magneto generates a low-frequency current. It takes a current of higher frequency than some magnetos generate to properly raise the voltage. For this reason vibrator coils are used.

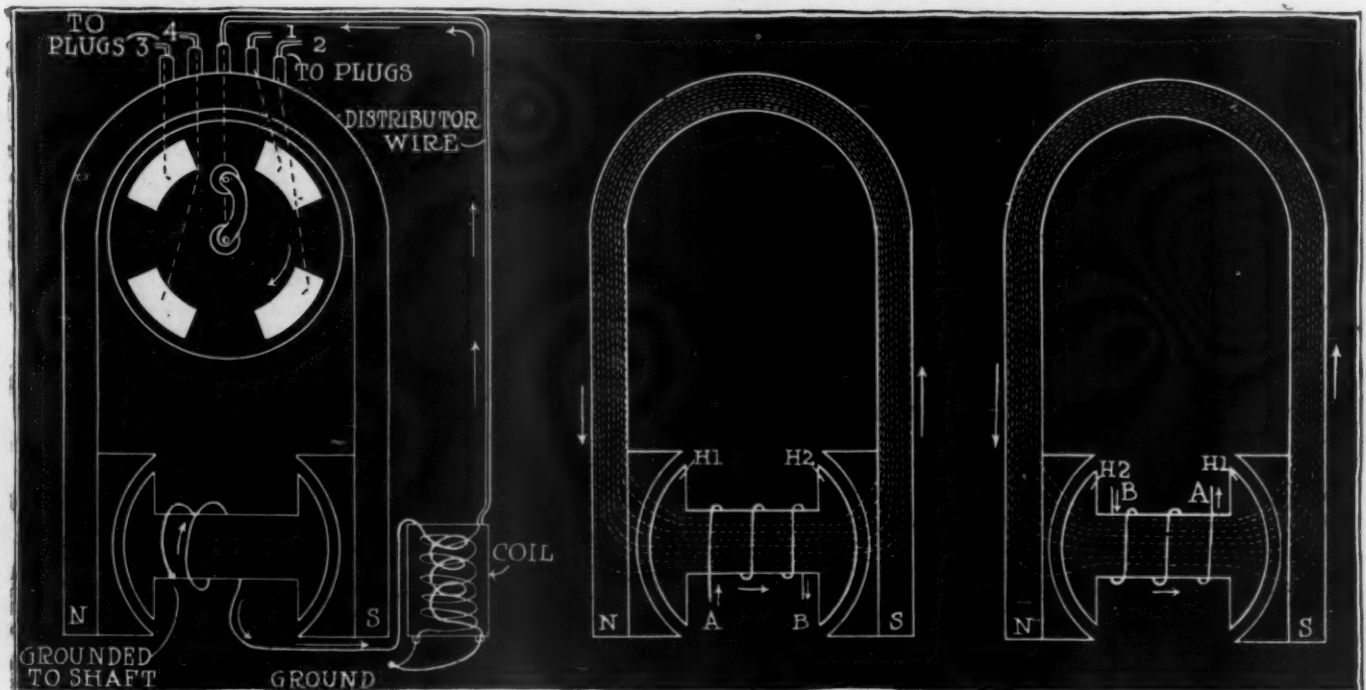


FIG. 43—SHOWING HOW ALTERNATING CURRENT IS GENERATED BY A MAGNETO. IN THE CENTER ILLUSTRATION CURRENT FLOWS FROM A TO B, BUT AT THE RIGHT THE ARMATURE HAS REVOLVED AND CURRENT FLOWS FROM B TO A.





# From the Four Winds



**BRAGG Touring Egypt**—Caleb Bragg, winner of the grand prize race at Milwaukee last year, is spending the winter in a tour through Egypt.

**California's Motor Registration**—Twenty-six thousand and four motor cars were registered by the secretary of state of California in February, 1913.

**Oregon Motor Stages Go All Winter**—The territory in and around Redmond, in central Oregon, is ideal for motoring and at no time during the present winter have the roads been too bad for travel by machine. Motor stage lines have been in operation all winter between Bend and Burns and Redmond and Pringle.

**Spokane Has Chinese Motorist**—Thomas Hong is the first Chinese motor car driver in Spokane, Wash. The young oriental completed his apprenticeship at the Inland Auto School, and his father, a wealthy merchant of Spokane, purchased a machine for him. Thomas Hong is a graduate of an eastern college.

**American Car Wins Swedish Classic**—In the annual ice racing classic on Lake Malar, Sweden, March 5, American cars distinguished themselves, a Hudson taking first place and a Cadillac getting second honors. Ice racing by motor car has become one of the popular sports of the Swedish people and thousands assemble along the Lake Malar course to watch the events. The Hudson went the kilometer at 65 miles an hour.

**Case Building New Racers**—Two new creations with motors just within the 450-cubic-inch limit prescribed by the Indianapolis speedway rules for the 500-mile race on Memorial day are being constructed at the experimental shops of the Case company in Racine and will be ready for try-outs in about 3 weeks. They will be handled by Louis Disbrow and Joe Nikrent, who campaigned together for the Case company last season. Farmer Bill Endicott, who spent part of his time last season under Disbrow in the track work of the Case racing team, is superintending the construction of a six-cylinder racer at the Case shops.

**New Orleans License Raised**—Talk of a higher license rate in New Orleans has raised a determined protest from owners and dealers. The license charged other users of the roads is so small in comparison that the difference is ridiculous, it is claimed. Heavy teaming and all classes of animal-drawn vehicles cause much more deterioration but pay little toward the upkeep of roads, and in consequence any additional taxation for road expense should be collected from them, it is urged by the car owners. Applicants for chauffeur's license in New Orleans will have to under-

go a physical examination in the future. Special attention will be given vision. No license will be issued to a person who is color blind or who has any other defect in sight.

**President Invited to Savannah Races**—President Woodrow Wilson is to be extended a special invitation to attend the grand prize and Vanderbilt cup races on the Chatham county course in November. This is the latest declaration of the Savannah Automobile Club, which will have charge of the classic events. Every effort will be made to have the president accept the invitation. It is possible that a special committee from the club will deliver the invitation to him in person in Washington.

**Truck Crosses Rocky Mountains**—J. W. Wainwright, a Federal truck distributor of Reno, Nev., recently drove the first truck that every attempted to journey over an almost impassable trail to the new camp of Rochester, Nev., a recently opened mining settlement. From there the truck was again piloted over the Rockies via almost indistinct trails to Winnemucca, 120 miles from Reno. Supplies and more than 1 ton of baggage, together with four passengers, were loaded on and the trip was made back to camp over another road that a teamster declared a truck could not negotiate. This return of 20 miles was made in 1 hour and 40 minutes, making most of the distance on high speed. From Rochester the trip was continued to Lovelock, 30 miles distant, and after a few days spent here the return trip was made with a 1,940-pound load through the worst snow storm experienced in that section of the country; 1,200 pounds of the load was taken into the upper camp, which is a grade of 600 feet in 1½ miles.

**Play Horse with Motor Bill**—That real humorists find their way to the state legislatures is attested by the amendments tacked on to a stringent bill for the regulating of motorists which was introduced recently in the legislature of North Dakota. The measure required motorists to stop when signaled by a driver of a horse-drawn vehicle, and the legislature proceeded to amend the bill by adding provisions requiring the driver to take his machine apart and hide it in the bushes when signaled. The amendments also required every motor car to "carry and use a 25-horsepower whistle," to carry a supply of rockets to discharge when approaching intersections, and to sprinkle the road for a distance of 80 rods when asked to do so by a farmer. The bill further was amended to include motorcycles, wheelbarrows, aeroplanes, submarine boats and baby carriages. The measure as amended

then was referred solemnly to the committee on military affairs, but it has not been recommended for passage to date.

**Horse Owners Fight Light Law**—The Elgin Horse Owners Protective Association sprang into existence last week, the sole object being to defeat the vehicle lighting ordinance proposed by the Elgin Motor Club, of Elgin, Ill., requiring every vehicle to carry a light. The Elgin commissioners adopted the ordinance, but a strong protest has been filed by livery men, private carriage owners, teamsters, grocers and expressmen.

**Ruling Interests Makers**—Donald McPherson, of Ballston Spa, N. Y., was awarded judgment last week of \$5,000 against the Buick Motor Co. McPherson was hurt when the wheel of a car sold to him collapsed. The allegation of the plaintiff was that the wheel was defective and that the motor concern was aware of it because wood of poor quality was used. One year ago the case was tried and nonsuited. The appellate division reversed the decision, holding that manufacturers of motor cars should be placed in the same class with manufacturers of goods not in themselves inherently dangerous but liable to injure because of some defect.

**Gettysburg to Tax Battlefield Hacks**—By a decision of the supreme court, the borough of Gettysburg is now able to enact and put in operation an ordinance taxing cars which are used for hacking purposes on the battlefield, and the town council likely will pass such a measure in time for the coming celebration in honor of the fiftieth anniversary of the battle, to be held July 1 to 4. It is estimated that at least 200,000 soldiers and tourists will be in town on that occasion. Last year an ordinance passed the council providing that all vehicles should be licensed on a basis of passenger-carrying capacity. The ordinance was vetoed on the ground that it worked a hardship on local liverymen and others who carried on an established business, while it would let out at an easy figure the transient or the man who operated only during the summer months. The ordinance was accordingly returned to the council, and when it came up for passage over the burgess' veto every councilman present voted against it, giving as their ground that court decisions did not allow the taxing of motor cars and that it would be unfair to tax liverymen and other guides and allow the motorist to go free. The superior court had ruled that the fact that a state tax was paid on machines made it illegal for boroughs to tax them, but recently the supreme court has overruled the superior court and it is now possible to impose a tax on cars for solic-

## Recent Club News

**T**HE Buffalo Automobile Club's country clubhouse at Clarence, N. Y., will be opened March 17 for the season, excepting dining service, which will be in operation later in the season.

Lancaster, Pa., has organized a motor club, officers being: President, J. O. Garrett; vice-president, C. J. Krehl; secretary, Peter P. Adolf; treasurer, Joseph F. Schaefer; directors: Dr. E. W. Ewell, J. E. Setter, Joseph Vogele, A. J. Majeski, W. A. Riegler.

Sounding the ultimate death knell of the bulb horn, directors of the Portland Automobile Club passed a resolution urging members and other motorists to confine themselves to the use of adequate warning signals.

At the annual meeting of the North Penn Motor Club held last week at Perkaskie, Pa., the following officers were elected for the ensuing year: President, Dr. A. F. Fretz; vice-president, O. L. Thompson; secretary, J. Samuel Bowen; treasurer, O. H. K. Myers. Addresses on the good roads problem were given by Warren F. Cressman, of the state highway department, and Hiram Keller, of Doylestown.

A motor club has been organized at Caldwell, Tex., with the following officers: J. A. Gray, president; J. W. Jenkins, secretary, and Hays Bowers, treasurer. A good roads committee was appointed to confer with the commissioners' court in regard to improving the highways of the county.

At the annual meeting this week of the Peoria, Ill., Auto Club new officers for the ensuing year were elected as follows: President, H. C. Roberts; vice-president, Valentine Jobst, Jr.; secretary, Warren Cowles; treasurer, C. E. Ulrich; directors: E. D. Hull, W. C. Collins, W. J. Case, E. L. Cole, R. E. Travis, S. L. Nelson, H. B. Pinkerton, R. H. Johnson, Carl Block and S. K. Hatfield. It was voted to erect a new clubhouse, and a committee was appointed to select a site and prepare an estimate of the cost, to report back at a subsequent meeting.

iting and hacking purposes. The ordinance which Burgess Holtzworth vetoed, or one very similar to it, will now come up before the council in the near future for action and it probably will pass, as the revenue amounts to a sum ranging from \$1,000 to \$1,500 annually.

**C. A. T. A. Election**—There was no opposition at the annual meeting of the Chicago Automobile Trade Association to the regular ticket that was placed in the field and so M. H. Van Sicklen succeeded himself as president. Charles M. Hayes was picked for vice-president, Henry Paulman for treasurer, Harry Fowler for secretary, while three 2-year directors were chosen—W. J. Hughey, E. C. Divine and L. B. Garrison. W. D. Foreman was elected director for 1 year.

**Freeport to Buy Motors with Fines**—Mayor Dittmar, of Freeport, Ill., has asked the city council to pass an ordinance to set aside all fines collected in the police court to be used as a fund for the purchase of a motor patrol and ambulance wagon. It is believed that in 6 months enough money will be secured to make the purchase. It is desired to remove all horses from the vicinity of the hall, for sanitary reasons and because the motor wagons cost less to maintain.

## Good Roads Brevities

**A** CONCRETE road will be built this spring to extend from La Salle, Ill., to Shipingsport, Ill. The materials for its construction have been donated by cement companies in the vicinity. The road, which will cost \$5,000 to build, will be 20 feet wide and 7 inches deep.

The Wisconsin Good Roads School, with John A. Hazelwood as chairman, will hold a convention in the state capitol from February 18 to 21, inclusive. Instructions will be issued as to the disposition of \$2,500,000 for the construction of permanent highways in Wisconsin.

With the increased number of motor trucks plying between Kentucky towns, the flimsy wooden bridges are considered unsafe. Steps are being taken to have constructed a more substantial form of bridge that will be safe as well as sturdy. The present form of wooden bridge is being damaged greatly as a result of truck freight carriers going from city to city.

Interest is being awakened in Denver and other Colorado cities by the determined efforts made by Wyoming to secure the adoption of the Overland route through Cheyenne, Wyo., and Ogden, Utah, as the first official highway from coast to coast. This interest has evidenced itself in the formation of the Denver branch of the Colorado-Utah Midland Trail Association. The officers and directors represent the Denver Chamber of Commerce, Denver Motor Club and Denver Automobile Dealers' Association. Other branches of the Midland Trail Association have been formed in Glenwood Springs and Grand Junction, Colo., and in Salt Lake City, Utah.

The Dupont Powder Co. recently has donated to the state of Oregon 2,900 feet of good highway. The grade has varied from 13½ to 10 per cent, but will be radically reduced by the company to 5 per cent, put in the best condition and then transferred to the state. The road is situated at Martin's Bluff, Ore.

## Governors Who Motor—Slaton of Georgia

**T**HE old order changeth, in Georgia as elsewhere. Joseph Brown, the former governor of Georgia, is not a motorist. He rode to and from the governor's mansion in a horse-drawn vehicle. His predecessor, Hoke Smith, was just the opposite. He drove himself and went through one Glidden tour. The new governor, John M. Slaton,

### By Percy H. Whiting

is an enthusiastic motorist and has been since 1907. That year, while on a visit to New York, he bought his first car, a Packard, and spent 2 weeks learning to use it. Since then he has been an enthusiast and at present owns his original car, which he uses when the mud is deep; a runabout and a touring car with a limousine body, all Packards. The governor seldom drives his car about the streets of Atlanta, but he drives frequently over the suburban roads.

Governor Slaton never has taken part in any tours, but his wife and her mother took part in the Bretton Woods Glidden tour. While acting governor in the fall of 1911 he went to Savannah to witness the running of the Vanderbilt cup and the grand prize and presented the trophies.

The new governor naturally is a good roads enthusiast. Of the road plans of the state he said recently, "I note with pleasure that Georgia spent more on its roads last year than any state in the union except New York. A matter of \$4,500,000 was expended, allowing for the wages that would have been paid had not the state used its misdemeanor convicts on the roads. We plan to go even further this year and I understand that a highway commission will be provided for, in order that the work may be intelligently done. At present our state university is doing good work in furnishing road engineers at cost to highway builders.

"In the matter of motor laws," continued Mr. Slaton, "I feel that Georgia is well equipped. The laws must require extreme care of motorists. I am glad to say that Georgia is about as free from serious motor car accidents as any state I know of and I hope it will continue so."



GOVERNOR SLATON  
OF GEORGIA







# Among the Makers and Dealers



**NEW Studebaker Salesrooms**—Before the spring is far advanced, Studebaker branches in St. Louis, Atlanta, Omaha, Minneapolis, Salt Lake City and Washington will all be housed in new homes, designed for the purpose.

**Milwaukee Strike Settled**—The Milwaukee Motor Co. of Milwaukee, Wis., which builds motors, met with labor troubles last week, but is again on full time. Four hundred men walked out, but the difficulty was patched up in a short time.

**Hoosiers Talk Gasoline**—A joint meeting of the Hoosier Motor Club and of the Indiana section of the Society of Automobile Engineers was held in the rooms of the club on the night of March 11. The principal speaker was H. Tipper, head chemist for the Texas Oil Co. of New York, and the general subject considered was gasoline.

**Gemmer May Make Starter**—It is reported that G. A. Gemmer, formerly of the Gemmer Mfg. Co., maker of steering gears, is organizing a company to manufacture an air-starting device which he has invented. It is said to be built upon the principle of the electric starter, having a combination pump and motor, the entire outfit weighing about 50 pounds.

**Mitchell Plant Rushed**—The plant of the Mitchell-Lewis Motor Co. at Racine, Wis., is now operating on a 24-hour schedule, three shifts of men being employed 8 hours a day each. The company some weeks ago started a 20-hour schedule, soon afterward increased this to 22 hours, and now to a full day. The company fell behind in production last fall by unexpected delays in perfecting its 1913 model, which is entirely new from anything ever produced at the Mitchell plant, and it was only recently that regular deliveries could be made. Nearly 2,100 men are employed. The usual midsummer interruption in production will be omitted this year, and the run will continue until the summer of 1914, at least.

**Lindsay Organizes Company**—A company to hold the patents of Thomas J. Lindsay has been organized in Indianapolis under the name of the Lindsay Auto Parts Co., which has been incorporated with an authorized capitalization of \$250,000. Mr. Lindsay is the inventor of many devices and parts, including the Lindsay roller bearing axle. The company will hold these patents and control the licenses granted other companies for manufacturing purposes. While the charter of the new company is broad enough to engage in the manufacturing business, it does not purpose engaging in manufacturing at the present time. Mr. Lindsay is one of the principal stockholders of the company, although he does not appear among the

directors. The officers and directors are Mahlon E. Bash, president; Joseph T. Head, vice-president, and Matt W. Lowder, secretary-treasurer.

**Hoover Company Expands**—The Hoover Steel Ball Co., recently organized in Ann Arbor, Mich., has purchased the steel ball department of the Flanders Mfg. Co. It is the intention of the Hoover company to move this department to its new factory, in Ann Arbor, about June 1. The new company will immediately double its plant.

**To Make Trucks**—Before the end of the year Spokane will have entered the field of motor car manufacturing and the Spokane truck will be on the market. Plans have been completed by the Spokane Auto-parts Co. to enlarge its plant and start the actual manufacturing of complete trucks. The present building of the company will be enlarged to a two-story brick, 50 by 120 feet. The managers of the new company are R. L. Dickerson and P. H. Witschge.

**Mohawk Buys Stein Plant**—The Mohawk Rubber Co., organized at Akron, O., and capitalized at \$350,000, has bought the Stein Double Cushion Tire Co. plant and machinery. The plant is located in East Akron, near the factory of the Goodyear Tire and Rubber Co. It consists of a 3-acre tract of land, a brick factory in good condition, with switching facilities, and free water rights, having a capacity of between seventy-five and 100 tires per day. The Stein company has discontinued and liquidated its business. The president of the new company will be R. M. Fillmore; superintendent, S. S. Miller; treasurer,

C. W. McLaughlin; M. E. Mason, secretary and sales manager. The directors are: C. D. Paxton, Cleveland, O.; J. K. Williams, Akron; F. J. Mishler, Akron; S. S. Miller, Francis Seiberling, C. W. McLaughlin and M. E. Mason, all of Akron.

**Chandler Moves to Cleveland**—The general offices and headquarters of the Chandler Motor Car Co., manufacturer of the Chandler light six, have been removed from Detroit to rooms 1105-1108 Swetland building, Cleveland, O. All business will be transacted from those offices until the completion of the new factory and offices.

**Ford Dealers Entertained**—Ford branch managers and dealers from Indianapolis, Columbus and Pittsburgh, together with newspaper men and others, were entertained by the Ford company at a banquet in Detroit Thursday night. Special trains brought the contingents from the three states Thursday morning, which was occupied in inspecting the factory. Later in the day the visitors were taken around the city in Ford cars. The gathering was not brought about for the purpose of stimulating sales, but to bring a closer fellowship relation among the Ford representatives, according to N. A. Hawkins, sales manager. In his address before the gathering at the banquet Mr. Hawkins touched upon the growth of the Ford concern since its inception. Short speeches were also made by several of the branch managers and others present. W. S. Gilbreath, of Indianapolis, made a plea for the co-operation of the Ford dealers in promoting the Indiana good roads movement.

**Aluminum Concerns Active**—The Wisconsin Aluminum Foundry Co., of Manitowoc, Wis., a large producer of aluminum castings for the motor trade, has decided to remain in Manitowoc, the Citizens' Association having come forward with a site for the new plant, which will be 200 by 75 feet in size, of steel and brick construction. At one time the company contemplated removing to another city because of unfavorable conditions, which have now been changed. Work on the new foundry will begin at once. The Aluminum Goods Co., which has plants in Manitowoc and Two Rivers, Wis., will enlarge both this summer. An addition, 100 by 60 feet, will be made at Two Rivers. The Standard Aluminum Co., of Two Rivers, Wis., will add a large rolling mill this year. An addition, 160 by 40 feet, will be erected at once to house the rolling mill equipment. The concern will become a large importer of French aluminum in the raw. The Aluminum Castings Co., with headquarters at Cleveland, O., and its principal western foundries at Manitowoc, Wis., is looking for a new location, claiming unfavorable labor and transportation conditions. It is

## Obituary

**ALFRED STROMBERG**, former president of the Stromberg Motor Devices Co., of Chicago, died Saturday noon at his home in Chicago, of apoplexy. He had been ill 3 weeks. He was born near Stockholm, Sweden, March 9, 1861, and lived to be 1 day less than 52 years old. He learned the telephone business in Sweden, coming to Chicago in 1883, where he identified himself with the Chicago Telephone Co. During his life he was connected with the Thompson-Houston Telephone Co., the Chicago Electric Protective Co., and organized the Stromberg-Carlson Telephone Co. Until 2 years ago he was president of the Stromberg Motor Devices Co., but since then has had no connection with that concern. He is survived by a widow and four children.

**EDWARD BUNCE**, formerly superintendent in Lockport, N. Y., of the American Motor Truck Co., died in Chicago, Ill., last week.

likely that Racine, Wis., will be selected as the site of the new works. The Manitowoc plant is running at a greatly reduced production due to the inability to obtain sufficient labor.

**Castle Company Elects Officers**—The following directors were elected at the annual meeting of the stockholders of the Castle Lamp Co., held in Toledo last week: E. A. Williams, Jr., Walter Stewart, Royal R. Scott, Rathbun Fuller and C. B. Mertz. Officers were elected as follows: E. A. Williams, Jr., president; Walter Stewart, vice-president and treasurer; Royal R. Scott, chairman of board and secretary.

**Trip for Packard Engineers**—An extensive test run is planned by the engineering department of the Packard Motor Car Co. to try out the 1914 model 48 cars. Frank H. Trego, research engineer of the company, and W. R. McCulla, assistant research engineer, together with two other members of the engineering staff, will leave the latter part of next week with four of the new cars for Albuquerque, N. M., via Denver, and return to Detroit. The trip is entirely for test purposes in order to judge of the caliber of the new sixes. Speed is one element of the run, which probably will not be left out. Going as it will over a comparatively new route, the party should meet with some interesting experiences worthy of recording by its photographer, even though it is not on pleasure bent.

**Adopt Department Store Idea**—It is hard to imagine a lot of motorists battling before a counter where there is a sale of spark plugs going on, yet that is what may happen when the Auto Center Co.,



**SCORNE**d as archaisms by proud aristocrat, progressive vehicle manufacturer and humble junk dealer, twenty-five phaetons, victorias and sulkies, equipments of southern beauty and beaux a score of years or more ago, were piled up in a heap and burned in Atlanta, Ga., recently, a sacrifice to the all-conquering motor car. Progress applied the torch to the pyre of antique carriages, which were valued at \$30,000 when the best families of Atlanta boasted of stables instead of garages. Considered the height of fashion 15 years ago, they were condemned as useless last week. For several years these aristocratic relics were stored in the rear of a shop belonging to John E. Smith, which was the popular agency for victorias and phaetons when the southern gentleman held the reins over blooded high steppers and frequented the driving paths of the city. But the shop changed with the times. Selected as the site for a three-story building of brick, where limousines and runabouts could be sold instead of victorias and sulkies, it was razed. The vehicles of the past were in the way. Former owners repudiated them, no one would accept them as a gift. They became ashes in a crackling pile of flames.

Inc., occupies its motorists' department store at Forty-second and Broadway, New York city. It will be real department store, conducted similar to Siegel & Cooper's. A part of the Longacre building has been taken over for the purpose and it is expected that the company will be ready

for business March 25. Later the adjoining building will be occupied for the selling of motor boats and supplies. The motorists' department store will be open from 8 a. m. until midnight. William A. Kelsey, of Washington, is president and John K. Stanley treasurer.

## Recent Incorporations

**Albany, N. Y.**—Carthage Auto Co., capital stock, \$5,000; incorporators, F. V. Kuhnert, A. W. Alderman.

**Anderson, Ind.**—Pierce Speed Controller Co., capital stock, \$25,000; to manufacture speed indicating and controlling devices; incorporators, G. W. Pierce, F. E. Mustard, U. M. McCullough.

**Bedford, O.**—Bedford Motor Bus Co., capital stock, \$10,000; to operate bus line; incorporators, M. Wallner, A. E. Smith, C. K. Brock.

**Boston, Mass.**—McDonald Rubber Co., capital stock, \$5,000; to manufacture rubber goods and tires; incorporators, B. H. Prouty, Jr., G. J. McDonald, E. F. Powers.

**Canton, O.**—Harper Tire & Rubber Co., capital stock, \$400,000; to manufacture and deal in tires; incorporators, W. D. Harper, H. Thomas, A. B. H. Vayo, B. B. Baughman, C. B. Bour.

**Cincinnati, O.**—Fred M. Ross Spring Wheel Co., capital stock, \$100,000; to manufacture and deal in hubs and wheels for motor cars; incorporators, T. Horstman, F. M. Ross, W. W. Baxter, H. Horstman, O. Hubber.

**Cleveland, O.**—Cleveland Speed Indicator Co., capital stock, \$10,000; to manufacture and deal in speed indicators; incorporators, A. Friedman, L. Friedman, O. Friedman, M. R. Stewart.

**Cleveland, O.**—Cleveland Motor Trucking Co., capital stock, \$10,000; to conduct trucking business; incorporators, J. C. Ross, C. B. Goetzfried, C. A. Cochran, R. W. Blake, H. Eckhoff.

**Detroit, Mich.**—Detroit Automobile Exchange, to deal in used cars; incorporators, G. C. Farnsworth, R. M. Drysdale, E. W. Pingree.

**Detroit, Mich.**—Superior Foundries Co., capital stock, \$30,000; incorporators, J. Stufes, W. L. Willard, H. T. Peters, R. T. Holte, J. G. Williams.

**Detroit, Mich.**—Moore Truck & Mfg. Co., capital stock, \$20,000; incorporators, F. A. Moore, H. A. Peters, C. W. McColi.

**Dover, Del.**—Carels Diesel Motor Co., capital stock, \$10,000,000.

**Dover, Del.**—Hollis Automobile Traction Jack Co., capital stock, \$250,000.

**East Orange, N. J.**—C. D. Inner Tube Protector Co., capital stock, \$150,000; to manufacture tires; incorporators, G. H. Field, J. H. Christian, T. Dick, H. H. Pickings.

**Huntington, W. Va.**—Fourth Avenue Garage, capital stock, \$10,000; to operate garage; incorporators, C. L. Hamilton, C. L. Leftwich, J. M. Stark, A. D. Stark, L. N. Cooks.

**Indianapolis, Ind.**—Hampton Mfg. Co., capital stock, \$35,000; to manufacture inner liners for tires; incorporators, S. B. Nussbaum, S. Rubens, M. Moskin.

**Los Angeles, Cal.**—Kendall Auto Co., capital stock, \$30,000; to operate garage; incorporators, A. C. Kendall, E. A. Truly, S. S. Wilder, W. R. Carrington, D. C. Porter.

**Los Angeles, Cal.**—Dollar Taxicab Co., capital stock, \$1,000; incorporators, L. E. Vaughn, F. Perry, J. R. Vaughn.

**Melrose, Mass.**—Auto Adjunct Co., capital stock, \$50,000; incorporators, J. E. Knapp, A. W. Eldredge, E. J. Sanderson.

**Milwaukee, Wis.**—Creek Motor Sales Co., capital stock, \$25,000; incorporators, R. C. Creek, N. M. Creek, W. M. Spencer.

**Muncie, Ind.**—Derrickson Mfg. Co., capital stock, \$125,000; to manufacture puncture proof compound for tires; incorporators, H. S. Osborn, H. L. Kitzelman, R. C. White.

**New York**—American Truck Co., capital stock, \$3,000,000; to manufacture, sell and deal in motor cars; incorporators, J. F. Curtin, H. O. Coughan.

**New York**—Brady Murray Motors Corp., capital stock, \$55,000; to manufacture motor trucks; incorporators, A. T. Murray, S. T. Marcus, C. Wein.

**New York**—Henry Tobin Co., capital stock, \$50,000; to deal in motor cars; incorporators, H. Tobin, R. F. Tobin, J. B. McDonough.

**New York**—Auto-Signalite Co., capital stock, \$2,000; motor car supplies; incorporators, R. C. Norton, A. D. Chersan, D. E. Koblish.

**New York**—Continental Rubber Works Selling Agent, capital stock, \$3,000; to deal in rubber goods and tires; incorporators, C. E. Thornall, W. A. Darling, W. S. Tullis.

**Patchogue, N. Y.**—John R. Swezey Automobile Co., capital stock, \$5,000; incorporators, J. R. Swezey, N. N. Swezey, E. B. Swezey.

**Philadelphia, Pa.**—Morgan & Marshall Co-operative Rubber & Tire Co., capital stock, \$500,000; to manufacture rubber tires; incorporators, R. J. Marshall, P. Marshall, M. Howells.

**Philadelphia, Pa.**—Par Keel Wheel Co., capital stock, \$100,000; to deal in motor cars; incorporators, F. S. Muzzey, F. Stanley, A. Guntz.

**Pittsburgh, Pa.**—Central Motor Car Co., capital stock, \$10,000.

**Richmond, O.**—Sedgwick Mfg. Co., capital stock, \$10,000; to manufacture motor car jacks; incorporators, R. Sedgwick, J. R. Sedgwick, J. M. Judson.

**Rochester, N. Y.**—Rochester Automobile Exchange, general motor car business; incorporators, E. J. Beller, B. E. Wilson, W. H. Mitchell, O. D. DeWitt.

**Rochester, N. Y.**—Central Motor Supply Co., capital stock, P. D. Barager, R. F. Close, W. Wood, C. W. Gallagher.

**South Orange, N. J.**—New York Simplex Auto School, capital stock, \$25,000; incorporators, J. E. Knapp, A. W. Eldredge, E. J. Sanderson.

**Springfield, Mass.**—Ball & Mitchell, capital stock, \$2,000; to manufacture parts; incorporators, J. Mitchell, J. Hall, Jr., C. F. Walsh.

**Victoria, Tex.**—Park Garage, capital stock, \$10,000; incorporators, J. Frazer, J. T. Linebaugh, W. H. Crain.

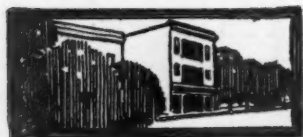
**Watertown, Mass.**—Bustin Rotary Motor Co., capital stock, \$50,000; directors, J. T. Bustin, J. H. Bustin, F. T. Bustin.

**Waynesboro, Va.**—Waynesboro Automobile Co., capital stock, \$15,000; incorporators, B. E. Watson, J. B. Young, J. M. Hanger.

**Whitestone, N. Y.**—Whitestone Garage, capital stock, \$5,000; incorporators, H. A. Tretman, J. A. O'Fee, M. E. O'Fee.

**Wilmerding, Pa.**—Valley Rapid Motor Co., capital stock, \$5,000.





# Among the Makers and Dealers



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**Milwaukee Strike Settled**—The Milwaukee Motor Co. of Milwaukee, Wis., which builds motors, met with labor troubles last week, but is again on full time. Four hundred men walked out, but the difficulty was patched up in a short time.

**Hoosiers Talk Gasoline**—A joint meeting of the Hoosier Motor Club and of the Indiana section of the Society of Automobile Engineers was held in the rooms of the club on the night of March 11. The principal speaker was H. Tipper, head chemist for the Texas Oil Co. of New York, and the general subject considered was gasoline.

**Gemmer May Make Starter**—It is reported that G. A. Gemmer, formerly of the Gemmer Mfg. Co., maker of steering gears, is organizing a company to manufacture an air-starting device which he has invented. It is said to be built upon the principle of the electric starter, having a combination pump and motor, the entire outfit weighing about 50 pounds.

**Mitchell Plant Rushed**—The plant of the Mitchell-Lewis Motor Co. at Racine, Wis., is now operating on a 24-hour schedule, three shifts of men being employed 8 hours a day each. The company some weeks ago started a 20-hour schedule, soon afterward increased this to 22 hours, and now to a full day. The company fell behind in production last fall by unexpected delays in perfecting its 1913 model, which is entirely new from anything ever produced at the Mitchell plant, and it was only recently that regular deliveries could be made. Nearly 2,100 men are employed. The usual midsummer interruption in production will be omitted this year, and the run will continue until the summer of 1914, at least.

**Lindsay Organizes Company**—A company to hold the patents of Thomas J. Lindsay has been organized in Indianapolis under the name of the Lindsay Auto Parts Co., which has been incorporated with an authorized capitalization of \$250,000. Mr. Lindsay is the inventor of many devices and parts, including the Lindsay roller bearing axle. The company will hold these patents and control the licenses granted other companies for manufacturing purposes. While the charter of the new company is broad enough to engage in the manufacturing business, it does not purpose engaging in manufacturing at the present time. Mr. Lindsay is one of the principal stockholders of the company, although he does not appear among the

directors. The officers and directors are Mahlon E. Bash, president; Joseph T. Head, vice-president, and Matt W. Lowder, secretary-treasurer.

**Hoover Company Expands**—The Hoover Steel Ball Co., recently organized in Ann Arbor, Mich., has purchased the steel ball department of the Flanders Mfg. Co. It is the intention of the Hoover company to move this department to its new factory, in Ann Arbor, about June 1. The new company will immediately double its plant.

**To Make Trucks**—Before the end of the year Spokane will have entered the field of motor car manufacturing and the Spokane truck will be on the market. Plans have been completed by the Spokane Auto-parts Co. to enlarge its plant and start the actual manufacturing of complete trucks. The present building of the company will be enlarged to a two-story brick, 50 by 120 feet. The managers of the new company are R. L. Dickerson and P. H. Witschge.

**Mohawk Buys Stein Plant**—The Mohawk Rubber Co., organized at Akron, O., and capitalized at \$350,000, has bought the Stein Double Cushion Tire Co. plant and machinery. The plant is located in East Akron, near the factory of the Goodyear Tire and Rubber Co. It consists of a 3-acre tract of land, a brick factory in good condition, with switching facilities, and free water rights, having a capacity of between seventy-five and 100 tires per day. The Stein company has discontinued and liquidated its business. The president of the new company will be R. M. Fillmore; superintendent, S. S. Miller; treasurer,

C. W. McLaughlin; M. E. Mason, secretary and sales manager. The directors are: C. D. Paxton, Cleveland, O.; J. K. Williams, Akron; F. J. Mishler, Akron; S. S. Miller, Francis Seiberling, C. W. McLaughlin and M. E. Mason, all of Akron.

**Chandler Moves to Cleveland**—The general offices and headquarters of the Chandler Motor Car Co., manufacturer of the Chandler light six, have been removed from Detroit to rooms 1105-1108 Swetland building, Cleveland, O. All business will be transacted from those offices until the completion of the new factory and offices.

**Ford Dealers Entertained**—Ford branch managers and dealers from Indianapolis, Columbus and Pittsburgh, together with newspaper men and others, were entertained by the Ford company at a banquet in Detroit Thursday night. Special trains brought the contingents from the three states Thursday morning, which was occupied in inspecting the factory. Later in the day the visitors were taken around the city in Ford cars. The gathering was not brought about for the purpose of stimulating sales, but to bring a closer fellowship relation among the Ford representatives, according to N. A. Hawkins, sales manager. In his address before the gathering at the banquet Mr. Hawkins touched upon the growth of the Ford concern since its inception. Short speeches were also made by several of the branch managers and others present. W. S. Gilbreath, of Indianapolis, made a plea for the co-operation of the Ford dealers in promoting the Indiana good roads movement.

**Aluminum Concerns Active**—The Wisconsin Aluminum Foundry Co., of Manitowoc, Wis., a large producer of aluminum castings for the motor trade, has decided to remain in Manitowoc, the Citizens' Association having come forward with a site for the new plant, which will be 200 by 75 feet in size, of steel and brick construction. At one time the company contemplated removing to another city because of unfavorable conditions, which have now been changed. Work on the new foundry will begin at once. The Aluminum Goods Co., which has plants in Manitowoc and Two Rivers, Wis., will enlarge both this summer. An addition, 100 by 60 feet, will be made at Two Rivers. The Standard Aluminum Co., of Two Rivers, Wis., will add a large rolling mill this year. An addition, 160 by 40 feet, will be erected at once to house the rolling mill equipment. The concern will become a large importer of French aluminum in the raw. The Aluminum Castings Co., with headquarters at Cleveland, O., and its principal western foundries at Manitowoc, Wis., is looking for a new location, claiming unfavorable labor and transportation conditions. It is

## Obituary

**ALFRED STROMBERG**, former president of the Stromberg Motor Devices Co., of Chicago, died Saturday noon at his home in Chicago, of apoplexy. He had been ill 3 weeks. He was born near Stockholm, Sweden, March 9, 1861, and lived to be 1 day less than 52 years old. He learned the telephone business in Sweden, coming to Chicago in 1883, where he identified himself with the Chicago Telephone Co. During his life he was connected with the Thompson-Houston Telephone Co., the Chicago Electric Protective Co., and organized the Stromberg-Carlson Telephone Co. Until 2 years ago he was president of the Stromberg Motor Devices Co., but since then has had no connection with that concern. He is survived by a widow and four children.

**EDWARD BUNCE**, formerly superintendent in Lockport, N. Y., of the American Motor Truck Co., died in Chicago, Ill., last week.

likely that Racine, Wis., will be selected as the site of the new works. The Manitowoc plant is running at a greatly reduced production due to the inability to obtain sufficient labor.

**Castle Company Elects Officers**—The following directors were elected at the annual meeting of the stockholders of the Castle Lamp Co., held in Toledo last week: E. A. Williams, Jr., Walter Stewart, Royal R. Scott, Rathbun Fuller and C. B. Mertz. Officers were elected as follows: E. A. Williams, Jr., president; Walter Stewart, vice-president and treasurer; Royal R. Scott, chairman of board and secretary.

**Trip for Packard Engineers**—An extensive test run is planned by the engineering department of the Packard Motor Car Co. to try out the 1914 model 48 cars. Frank H. Trego, research engineer of the company, and W. R. McCulla, assistant research engineer, together with two other members of the engineering staff, will leave the latter part of next week with four of the new cars for Albuquerque, N. M., via Denver, and return to Detroit. The trip is entirely for test purposes in order to judge of the caliber of the new sixes. Speed is one element of the run, which probably will not be left out. Going as it will over a comparatively new route, the party should meet with some interesting experiences worthy of recording by its photographer, even though it is not on pleasure bent.

**Adopt Department Store Idea**—It is hard to imagine a lot of motorists battling before a counter where there is a sale of spark plugs going on, yet that is what may happen when the Auto Center Co.,



**SCORNE**d as archaisms by proud aristocrat, progressive vehicle manufacturer and humble junk dealer, twenty-five phaetons, victorias and sulkies, equipages of southern beauty and beaux a score of years or more ago, were piled up in a heap and burned in Atlanta, Ga., recently, a sacrifice to the all-conquering motor car. Progress applied the torch to the pyre of antique carriages, which were valued at \$30,000 when the best families of Atlanta boasted of stables instead of garages. Considered the height of fashion 15 years ago, they were condemned as useless last week. For several years these aristocratic relics were stored in the rear of a shop belonging to John E. Smith, which was the popular agency for victorias and phaetons when the southern gentleman held the reins over blooded high steppers and frequented the driving paths of the city. But the shop changed with the times. Selected as the site for a three-story building of brick, where limousines and runabouts could be sold instead of victorias and sulkies, it was razed. The vehicles of the past were in the way. Former owners repudiated them, no one would accept them as a gift. They became ashes in a crackling pile of flames.

Inc., occupies its motorists' department store at Forty-second and Broadway, New York city. It will be real department store, conducted similar to Siegel & Cooper's. A part of the Longacre building has been taken over for the purpose and it is expected that the company will be ready

for business March 25. Later the adjoining building will be occupied for the selling of motor boats and supplies. The motorists' department store will be open from 8 a. m. until midnight. William A. Kelsey, of Washington, is president and John K. Stanley treasurer.

**Albany, N. Y.**—Carthage Auto Co., capital stock, \$5,000; incorporators, F. V. Kuhnert, A. W. Alderman.

**Anderson, Ind.**—Pierce Speed Controller Co., capital stock, \$25,000; to manufacture speed indicating and controlling devices; incorporators, G. W. Pierce, F. E. Mustard, U. M. McCullough.

**Bedford, O.**—Bedford Motor Bus Co., capital stock, \$10,000; to operate bus line; incorporators, M. Wallner, A. E. Smith, C. K. Brock.

**Boston, Mass.**—McDonald Rubber Co., capital stock, \$5,000; to manufacture rubber goods and tires; incorporators, B. H. Prouty, Jr., G. J. McDonald, E. F. Powers.

**Canton, O.**—Harper Tire & Rubber Co., capital stock, \$400,000; to manufacture and deal in tires; incorporators, W. D. Harper, H. Thomas, A. B. H. Vayo, B. B. Baughman, C. B. Bour.

**Cincinnati, O.**—Fred M. Ross Spring Wheel Co., capital stock, \$100,000; to manufacture and deal in hubs and wheels for motor cars; incorporators, T. Horstman, F. M. Ross, W. W. Baxter, H. Horstman, O. Hubber.

**Cleveland, O.**—Cleveland Speed Indicator Co., capital stock, \$10,000; to manufacture and deal in speed indicators; incorporators, A. Friedman, L. Friedman, O. Friedman, M. R. Stewart.

**Cleveland, O.**—Cleveland Motor Trucking Co., capital stock, \$10,000; to conduct trucking business; incorporators, J. C. Ross, C. B. Goetzfeld, C. A. Cochran, R. W. Blake, H. Eckhoff.

**Detroit, Mich.**—Detroit Automobile Exchange, to deal in used cars; incorporators, G. C. Farnsworth, R. M. Drysdale, E. W. Pingree.

**Detroit, Mich.**—Superior Foundries Co., capital stock, \$30,000; incorporators, J. Stufges, W. L. Willard, H. T. Peters, R. T. Holte, J. G. Williams.

**Detroit, Mich.**—Moore Truck & Mfg. Co., capital stock, \$20,000; incorporators, F. A. Moore, H. A. Peters, C. W. McCall.

**Dover, Del.**—Carels Diesel Motor Co., capital stock, \$10,000,000.

**Dover, Del.**—Holts Automobile Traction Jack Co., capital stock, \$250,000.

**East Orange, N. J.**—C. D. Inner Tube Protector Co., capital stock, \$150,000; to manufacture tires; incorporators, G. H. Field, J. H. Christian, T. Dick, H. H. Pickings.

## Recent Incorporations

**Huntington, W. Va.**—Fourth Avenue Garage, capital stock, \$10,000; to operate garage; incorporators, C. L. Hamilton, C. L. Leftwich, J. M. Stark, A. D. Stark, L. N. Cooks.

**Indianapolis, Ind.**—Hampton Mfg. Co., capital stock, \$35,000; to manufacture inner liners for tires; incorporators, S. B. Nussbaum, S. Rubens, M. Moskin.

**Los Angeles, Cal.**—Kendall Auto Co., capital stock, \$30,000; incorporators, A. C. Kendall, E. A. Truly, S. S. Wilder, W. R. Carrington, D. C. Porter.

**Los Angeles, Cal.**—Dollar Taxicab Co., capital stock, \$1,000; incorporators, L. E. Vaughn, F. Perry, J. R. Vaughn.

**Melrose, Mass.**—Auto Adjunct Co., capital stock, \$50,000; incorporators, J. E. Knapp, A. W. Eldredge, E. J. Sanderson.

**Milwaukee, Wis.**—Creek Motor Sales Co., capital stock, \$25,000; incorporators, R. C. Creek, N. M. Creek, W. M. Spencer.

**Muncie, Ind.**—Derrickson Mfg. Co., capital stock, \$125,000; to manufacture puncture proof compound for tires; incorporators, H. S. Osborn, H. L. Kitzelman, R. C. White.

**New York**—American Truck Co., capital stock, \$3,000,000; to manufacture, sell and deal in motor cars; incorporators, J. F. Curtin, H. O. Coughan.

**New York**—Brady Murray Motors Corp., capital stock, \$55,000; to manufacture motor trucks; incorporators, A. T. Murray, S. T. Marcus, C. Wein.

**New York**—Henry Tobin Co., capital stock, \$50,000; to deal in motor cars; incorporators, H. Tobin, R. F. Tobin, J. B. McDonough.

**New York**—Auto-Signalite Co., capital stock, \$2,000; motor car supplies; incorporators, R. C. Norton, A. D. Chersan, D. E. Koblish.

**New York**—Continental Rubber Works Selling Agent, capital stock, \$3,000; to deal in rubber goods and tires; incorporators, C. E. Thornall, W. A. Darling, W. S. Tullis.

**Patchogue, N. Y.**—John R. Swezey Automobile Co., capital stock, \$5,000; incorporators, J. R. Swezey, N. N. Swezey, E. B. Swezey.

**Philadelphia, Pa.**—Morgan & Marshall Co-operative Rubber & Tire Co., capital stock, \$500,000; to manufacture rubber tires; incorporators, R. J. Marshall, P. Marshall, M. Howells.

**Philadelphia, Pa.**—Par Keel Wheel Co., capital stock, \$100,000; to deal in motor cars; incorporators, F. S. Muzey, F. Stanley, A. Guntz.

**Pittsburgh, Pa.**—Central Motor Car Co., capital stock, \$10,000.

**Richmond, O.**—Sedgwick Mfg. Co., capital stock, \$10,000; to manufacture motor car jacks; incorporators, R. Sedgwick, J. R. Sedgwick, J. M. Judson.

**Rochester, N. Y.**—Rochester Automobile Exchange, general motor car business; incorporators, E. J. Beller, B. E. Wilson, W. H. Mitchell, O. D. DeWitt.

**Rochester, N. Y.**—Central Motor Supply Co., capital stock, P. D. Barager, R. F. Close, W. Wood, C. W. Gallagher.

**South Orange, N. J.**—New York Simplex Auto School, capital stock, \$25,000; incorporators, J. E. Knapp, A. W. Eldredge, E. J. Sanderson.

**Springfield, Mass.**—Ball & Mitchell, capital stock, \$2,000; to manufacture parts; incorporators, J. Mitchell, J. Hall, Jr., C. F. Walsh.

**Victoria, Tex.**—Park Garage, capital stock, \$10,000; incorporators, J. Frazer, J. T. Linebaugh, W. H. Crain.

**Watertown, Mass.**—Bustin Rotary Motor Co., capital stock, \$50,000; directors, J. T. Bustin, J. H. Bustin, F. T. Bustin.

**Waynesboro, Va.**—Waynesboro Automobile Co., capital stock, \$15,000; incorporators, B. E. Watson, J. B. Young, J. M. Hanger.

**Whitestone, N. Y.**—Whitestone Garage, capital stock, \$5,000; incorporators, H. A. Tretman, J. A. O'Fee, M. E. O'Fee.

**Wilmerding, Pa.**—Valley Rapid Motor Co., capital stock, \$5,000.





# The Motor Car Repair Shop

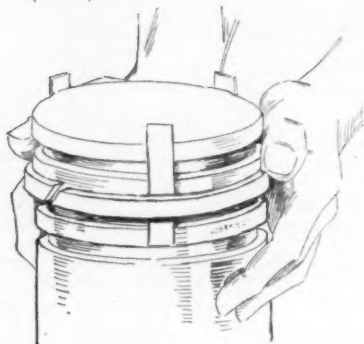
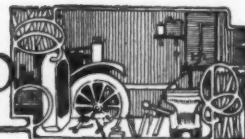


FIG. 1—SLIPPING RING OVER PISTON ON SAW BLADES

INASMUCH as the fitting of piston rings requires much accuracy, the average repairman is satisfied if the ring merely fits into the guide in the piston. But so much is dependent upon the rings that a great deal of care should be exercised in fitting them to the piston.

The first move in fitting rings is to get the grooves or guides of the piston thoroughly clean. The piston should be immersed in gasoline and sprayed thoroughly to remove the least particle of dirt. Much time and labor may be saved by seeing first which ring most nearly fits a given groove.

## Fitting Ring in Groove

Fig. 3 shows how the ring should be started in the groove and the arrows show the direction in which the ring should be moved. The entire circumference of the ring should be rolled around the groove. The figure shows a ring with its end cut peculiarly. There are a number of types of ring ends, the illustrations showing two of them. Of course if the ring will not fit into the groove, try another groove. The reason the back end of the ring is fitted first instead of the inner is because the latter fitting would require that the ring be put in its usual position around the piston. Slipping the rings over the piston head is not easy in itself and would be difficult were the rings not of the proper size.



FIG. 3—INITIAL FITTING OF RING BY ROLLING IT IN ITS GROOVE

## Replacing Piston Rings

The ring should next be inserted into the cylinder to determine whether the ends are the proper distance apart. The distance between the ring ends when the ring is in the cylinder varies with the different designs. It is best to get factory advice on this matter. An electric lamp dropped into the cylinder, while the ring is in, will show immediately whether the ends of the ring are touching. If they do touch, they should be filed slightly, as shown in Fig. 4. The ring should be placed in a vise with one end protruding about an inch. A little is left sticking out so that it will not sway when filing is being done. The file, a very fine mill file, is placed between the ends as the sketch shows. With the left hand the long end of the ring is pressed lightly against the file. The operation should continue for a short time only. About twelve strokes of the file are sufficient. The ring should be put back in the cylinder and the distance between the ends measured with a thickness gauge or, as it is called by factory men, a feeler. Fifteen thousandths is a good distance to allow if the factory measurement cannot be obtained.

The next step is to make it fit its groove perfectly. Lapping is the term applied to the operation of grinding the ring down so that it fits. A level steel surface is used. Upon this surface is sprinkled enough very fine emery dust to cover it. Enough water is added then to make the mass of a pasty consistency. The ring is placed then on the steel plate. A block of wood about 6 by 6 inches is placed on top of the ring, and then exerting slight pressure on the block the ring is carried back and forth over the emery.

## Lapping-in the Ring

You have seen women use washboards? That same method of rubbing is used, only on level plane instead of at an angle. If the ring will not stay under the wooden block cut a little notch in the block to hold the ring still. Lapping should not continue for a long period on one side. The ring should be turned over. The entire operation should not last longer than 1 minute. After lapping, the ring should be immersed in clean gasoline and fitted to the groove. Not any groove, but the groove which it nearly fitted before. If every part of the circumference of the ring fits every part of the groove then lapping is complete and the ring may be tagged to designate its location. 1-1 on a tag is made usually to represent first cylinder, ring number 1. Ring 1 is that nearest the top of the piston. If one part of the ring fits and another part does not, the high spot shows up when the ring is dipped in



FIG. 2—REPLACING TOP RING—LOWER RING SHOULD BE IN PLACE

gasoline and then rubbed with cloth. The high spot will be more shiny than the rest.

File perfectly flat and take a little off from both sides of the ring. Just a little at a time, and try the ring after each slight filing. When all the rings have been fitted in this way the next step is to place them in their respective grooves, making them occupy the position they would when in use.

## Replacing the Rings

In Fig. 1 is shown a method for doing this. Ring number 4 should first be placed in position. For this operation three pieces of saw blade with the teeth ground off are used. Hold one blade against the piston with the left hand. With the right hand bring one end of the ring in contact with the blade.

Get the blade about  $\frac{1}{2}$  inch from the end of the ring, so that you will be able to hold the blade in place by pressure against the ring. Then slip the ring over the piston top. There is a space on either side of the blade through which the other blades may be inserted. Push the blades around until they appear as shown in Fig. 1. By sliding the ring on the three blades it may be placed easily in its groove.

With the lapped ring in its groove, the ring must fit so that it may be turned around easily. No up or down play must exist.



FIG. 4—FILING THE ENDS, USING VICE FOR HOLDING THE RING



# Development Briefs



## Two New Guide Lamps

IN Fig. 2 are shown two of the latest products of the Guide Motor Lamp Mfg. Co. That on the left of the illustration is termed by the maker the torpedo taillight. The illustration on the right is a new speedometer light. It is made with pull-chain as illustrated, but upon request will be produced in the ordinary plain socket. This light is manufactured in a variety of shapes suitable to different conditions. The lamp uses a 4-candlepower 6-volt Mazda bulb. The finish is optional. A characteristic of Guide motor lamps is the reflector. The maker has taken particular pains to produce a reflector that will retain its light-throwing qualities for a long period. A book is being distributed by the Guide company called "The Truth About Automobile Lamps," which gives many interesting facts concerning the lighting equipment of a motor car.

## Hydro Non-Skid Tire

In introducing the Hydro pneumatic tire, the St. Louis Tire & Rubber Co. claims that the tire is made under circumstances that cause uniformity of production. The tire is built by hand on a form and then placed in a mould. Hydraulic pressure is applied from the inside, thus causing the tire fabric to expand against the mould. The maker claims that this pressure method stretches each layer of fabric equally and since the pressure in each mould is the same all the tires will be uniform in construction. The non-skid feature of the new St. Louis product is a series of depressions, as shown in Fig. 4. It is claimed that on wet pavement the depressions cause the pavement in contact to become dry, thus affording a good traction surface for the plain part of the tire, following the depression.

## Townsend Grease Gun

Believing that the ordinary form of grease-injecting apparatus is not qualified

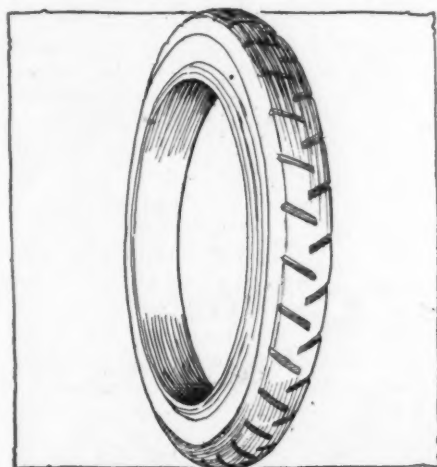


FIG. 4—HYDRO TIRE, A PRODUCT OF ST. LOUIS TIRE CO.

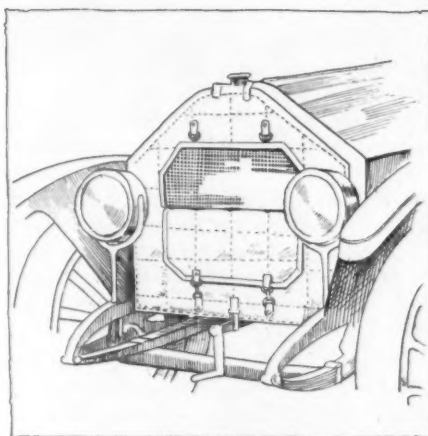


FIG. 1—H. W. JOHNS-MANVILLE CO.'S RADIATOR SHIELD

to perform the work of supplying lubricant to certain parts of the motor car, S. P. Townsend & Co. is marketing a peculiar form of grease gun. The device, which has been on the market for some

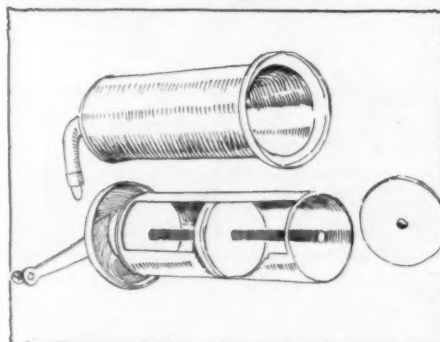


FIG. 3—TOWNSEND CYLINDER GREASE GUN

time, is shown in Fig. 3. Grease is loaded into the cylinder, which is 2½ inches in diameter and 8 inches long. One end is fitted with a curved spout, as the illustration shows. The cylinder is slipped over the apparatus containing the piston. The

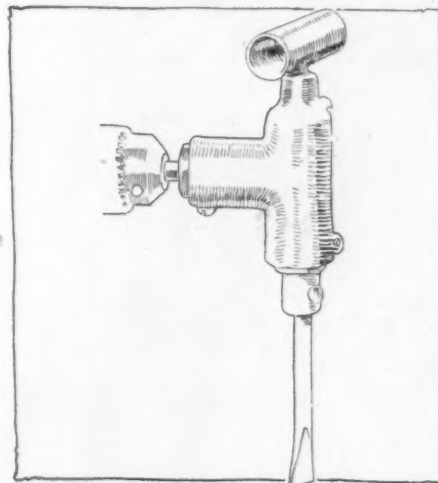


FIG. 5—TEMCO ELECTRIC VALVE GRINDING TOOL

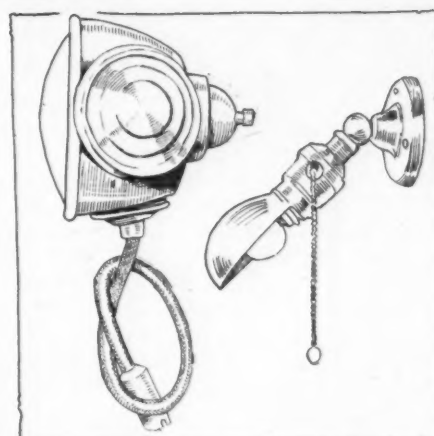


FIG. 2—TWO NEW GUIDE LAMPS FOR 1913

piston is operated by a crank. Three disks comprise the piston; one of these is made of leather, another of iron and the third of steel. A long screw extends almost the entire length of the cylinder. It is shown in position in Fig. 3. When the crank is rotated, the screw turns but does not move longitudinally. The piston, on the other hand, travels along the tube, but does not revolve. As it moves, it pushes the grease before it, out through the spout.

## Temco Valve-Grinding Tool

The Temco Electric Motor Co. is marketing an electric valve-grinding tool. It may be operated on any single or multi-phase circuit. Fig. 5 shows the method of attachment of the Temco valve grinder. The tool was designed for use in garages operating model B drill. A decided feature of the apparatus is the fact that the stem operating the valve is allowed but a three-eighths turn. It has the same speed as the drill spindle. The reason only a three-eighths turn is permitted is because a better ground surface is obtained with this method. It is conceded that when the valve is turned around completely face and seat are not ground accurately. Temco electric tools are designed to be used in an ordinary lighting circuit of 110 volts.

## J-M Keystone Radiator Shield

With a view to solving the freezing radiator problem the H. W. Johns-Manville Co. has brought out a shield marketed under the name of the J-M Keystone radiator shield. It consists of a thick layer of cow hair quilted between two layers of waterproof imitation leather. A flap in the center of the shield, as shown in Fig. 1, is designed to be lifted when the car is running to admit air under the hood. It may be attached to any standard radiator by means of adjustable straps. A feature of the shield is that it may be folded and placed under the seat, without in any way being injured.





# Manufacturers' Communications

## USE AND ABUSE OF MOTOR SPIRITS

**C**HICAGO—Editor Motor Age—The new power fuel, Motor Spirits, while being designated chiefly for heavy duty gasoline engines in motor trucks, tractors, etc., undoubtedly will find its way into the tanks of many pleasure cars, on account both of its greater range of mileage and its lower cost. Motor Spirits, while it belongs to the same group as naphtha and gasoline, differs in some respects, and must be used according to its peculiarities. For purposes of power, in the production of which it ranks well up with the so-called high-grade gasoline, Motor Spirits yields an increase of over 10 per cent, and is adaptable to all styles of motors now using gasoline.

The pungent odor noticeable from the liquid Motor Spirits, which is disagreeable in some cases, is absorbed almost entirely in the process of combustion, and leaves the exhaust almost odorless. The blueish white or gray smoke noticeable in the exhaust is not continuous, but is due to a sudden opening of the throttle, which throws an abnormal load on the carbureter and intake manifold, causing unusual friction of air along the inner surface of the manifold, which friction, absorbing suddenly all liquid drops caused by condensation along the walls of the cold piping, carries into the combustion chamber a charge of raw spirits too rich to be entirely consumed, so is exhausted in the form of smoke, or incomplete combustion.

This fault is noticeable only in the colder weather and in a cold motor, and can be entirely, or nearly, overcome by jacketing the intake manifold above the carbureter, either for warm water or the hot blast from exhaust. If jacket is attached it should cover as much of the manifold as is practicable, and by all means should cover the parts which lay horizontal, and in which are possible pockets for lodgment of any fluid condensation.

If warm air is to be taken through the carbureter, it should be taken at both the initial, or primary, air intake, and the auxiliary, or high-speed part, so that sudden opening of throttle will not cause the motor to load or backfire when cool. The carbureter should be adjusted to a warm motor, as this is its running condition, generally allowing more air in proportion for the spirits than for gasoline, keeping the volume of mixture as thin as possible; that is, feeding as little fuel as possible.

The thinner the mixture, the less the condensation; the less the condensation, the less the smoke; the less the smoke, the more the mileage. The walls of lubricant built up in the cylinders and on the piston are not affected by Motor Spirits as

quickly as by gasoline, which indicates that the amount of oil being used with gasoline can be materially decreased with perfect safety in using spirits.

In brief, the best results, both in power and mileage economy, from the use of Motor Spirits, are obtained with just as small amount of both lubricant and fuel as is possible, using kerosene as a cleanser frequently—about a pint through primer, or through carbureter directly into air take, once a week, and keeping the ignition system in tune. Again—do not use an over-rich mixture.—W. O. Dixon, Standard Oil Co. of Indiana.

## H. B. JOY ON PRICE-CUTTING

**Detroit, Mich.**—Editor Motor Age—The control of the retail price by the manufacturer, when the fixed and published retail price is actually, honestly and inviolably maintained by the manufacturer and by his representatives, the retail dealers, is the only honest, square way to insure fair dealing between the manufacturer and his patrons. Such a method and such only is square, honest business.



### The Gasoline Automobile

"The Gasoline Automobile" is the title of one of the recent products of the American School of Correspondence, Chicago, and is listed at \$2. It is from the pens of Victor Loughheed and Morris A. Hall and is divided into three parts, headed respectively, "Gasoline Automobiles," "Private Garages and Repairs" and "Automobile Driving." These three sections comprise a book of some 300 pages intended primarily for the amateur. As the volume is compiled from the instruction papers intended for correspondence study, an endeavor is apparent to present the subjects in simple terms and without the intricate calculations sometimes met with in works of a similar nature.

It is plentifully illustrated with catalog reproductions. One section of the book is devoted to the care and operation of the motor car and should prove valuable to many. A short treatise on electric lighting of the car is an evidence of up-to-dateness, but the article on engine starters is so badly out of date as to be worse than useless. A particularly commendable feature is the section on garages and repairs for the private owner. This part is the brightest spot in the whole work, and should be of value to owners who house and care for their cars.

The department of justice is, by pending litigation under the Sherman act, seeking to prevent the control of the resale price to the consumer after the sale of the product to the dealer by the manufacturer has been consummated. This is wrong in principle and wrong in fact. It tends to force and actually will compel unfair competition, resulting in one price to one consumer and another price to another.

We have demanded that the railroads should establish, publish and maintain equal freight rates to all. Why are we so fussy about railroad rates? Yet we institute legal proceedings to prevent the Kellogg Toasted Corn Flake Co. from treating all the consumers of its product alike. The government would be in better business if it sought to compel equal treatment to all.

If the department of justice sought to compel a manufacturer to maintain established list prices by interpreting the Sherman act to mean that cut prices below the manufacturers' fixed and published prices was conspiracy in restraint of trade, which it actually is, great good would be accomplished in promoting honesty in business.

We jailed and fined railroad officials for cutting prices on freight! Why is not the same principle applicable to products of manufacturers in relation to the consumers of their goods?

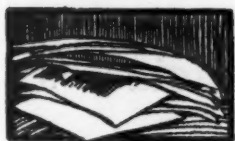
We have a right to demand equal and fair treatment to all. Competition still will exist in its broadest and best sense and in the most beneficial form to all concerned.

If a manufacturer establishes and publishes a consumers' price he should be compelled to maintain it, and if a sale at less than list price can be proven to have been made by his dealers or agents, then all sales for a period of, say, 30 days prior to the cut price sale should be adjusted to that basis.

In such a condition it is plain that published prices would be maintained. The confiding purchaser would not be cheated, as is now largely the practice. Purchases could be made with one-tenth the expenditure of time, talent and energy in shopping and negotiating, and all consumers would be treated alike and each get a square deal.

It is obvious also that established published prices would be fixed at their proper and legitimate point. A published price would mean the real actual value of the article, at which it must sell on its merits in competition with other like products.

Competition would be transformed from "sharp and unscrupulous business methods" to the basis of "quality, merit and service."—Henry B. Joy, president Packard Motor Car Co.



# Brief Business Announcements



**COSHOCTON, O.**—F. E. Lucas, of Cleveland, has purchased the Fifth Street garage from Warner Lowe.

**Detroit, Mich.**—The capital stock of the Gies Gear Co. has been decreased from \$50,000 to \$25,000.

**Seattle, Wash.**—Thomas B. Pritchard has been appointed sales manager of the M. S. Bringham Motor Car Co., Cadillac agent.

**Columbus, O.**—The Midgley Mfg. Co., has filed papers with the secretary of state decreasing its capital stock from \$250,000 to \$25,000.

**Dayton, O.**—The Air Friction Carburetor Co. has filed papers with the secretary of state increasing its capital stock from \$20,000 to \$30,000.

**Philadelphia, Pa.**—The Gregg-William D. Rogers Co., 1926 Arch street, has secured the local agency of the Edwards-Knight, with William C. Yerkes in charge.

**Montreal, Can.**—The Provincial Motors Ltd. has opened showrooms in the New Birks building to handle Locomobile cars. Mr. Roberts has been appointed sales manager.

**Detroit, Mich.**—O. E. Stoll has been appointed assistant sales manager of the General Motors Truck Co., to fill the vacancy occasioned by the transfer of E. J. Kilborn to Chicago as manager of the branch there.

**Columbus, O.**—The Rogers Supply and Tire Co., of North Fourth street, has filed papers with the secretary of state increasing its capital stock from \$10,000 to \$25,000. The increase in capital will be used in fitting up a larger storeroom and warehouse.

**Toronto, Ont.**—The Dunlop Tire and Rubber Co. has concluded an agreement with the Century Rubber Co. for the exclusive use and manufacture of Fabricord tires in Canada. The goods produced in Canada will be known as the Dunlop-Century Fabricord tires.

**San Francisco, Cal.**—Rene J. Marx has resigned as general manager of the Simplex Mercer Pacific coast agency in order to take up the distribution of Mercedes cars west of the Mississippi river. The new firm will be known as Rene J. Marx & Co. Mr. Marx will be president and general manager and Paul La Croix vice-president.

**Indianapolis, Ind.**—Andrew C. Fearing, formerly with the Archey-Atkins Co., has formed the Ohio Electric Sales Co. and will handle the Ohio electric. The company will have permanent quarters at Meridian and Walnut streets and until these are ready is maintaining offices at 1127 State Life building.

**Springfield, Mass.**—The Auto Parts and Repair Co. has leased a portion of the Atlas Motor Car Co.'s factory and will have a full stock of parts of Atlas cars. Both Atlas cars and other makes of cars will be repaired. This company is under the management of P. A. Williams, Jr., late of the Atlas Motor Car Co.

**Milwaukee, Wis.**—The J. I. Case Threshing Machine Co., of Racine, Wis., is operating its new branch house here. The branch is located in a new garage building erected by the Racine company at 495-501 Broadway, and will be under the direction of C. C. Doring, manager of the Case company's general branch house at Madison, Wis. James A. Biddison will be local manager. Within a few weeks the company will establish a

sub-branch to serve the south side of Milwaukee and located at Eleventh and Greenfield avenues.

**Detroit, Mich.**—W. P. Haines has been appointed advertising manager of the Anderson Electric Car Co., succeeding W. J. St. Onge, resigned.

**Toledo, O.**—The Mather Spring Co. has filed papers with the secretary of state increasing its capital stock from \$100,000 to \$300,000.

**Indianapolis, Ind.**—A factory sales branch of the Standard Roller Bearing Co., of Philadelphia, will be opened shortly with L. M. Watkins, Jr., as manager.

**Buffalo, N. Y.**—Announcement has been made by the Thomas B. Jeffery Co. of the appointment of J. A. Cramer as exclusive representative for the Rambler in this territory.

**San Francisco, Cal.**—The Case car is now represented here. Headquarters have been established with the J. I. Case Threshing Machine Co. E. S. Jones is named as distributor.

**Racine, Wis.**—J. B. Williams and A. H. Jerstad have resigned their positions with the Mitchell-Lewis Motor Co. and will engage in the wholesale and retail business at Wausau, Wis.

**Philadelphia, Pa.**—The J. Harry Schumacker Co., local distributor of the Dorris car, has opened downtown headquarters at 330 North Broad street. The company also maintains a garage and machine shop at 4819 Frankford avenue, Frankford.

**Akron, O.**—I. R. Bailey, formerly manager of the mechanical goods department of the Diamond Rubber Co., has been appointed manager of the mechanical goods department of the Goodyear Tire and Rubber Co., Akron, O. From the Diamond with Mr. Bailey comes W. M. Metzler, who for 15 years has been

factory superintendent of the mechanical goods department of the Diamond Rubber Co.

**Cleveland, O.**—The Pennsylvania Rubber and Supply Co. will increase its capital stock from \$25,000 to \$75,000.

**Indianapolis, Ind.**—B. M. Wiley has taken the agency for the Mitchell and has established quarters at 428 North Capitol avenue.

**Rochester, N. Y.**—W. T. Norton, assistant engineer of the Selden Motor Vehicle Co., has been promoted to the position of general superintendent of the Selden factory.

**Philadelphia, Pa.**—The Philadelphia agency of the Kisselcar, 336 North Broad street, has been transferred from C. H. Miller to C. H. McCausland, with J. J. Kane, Jr., as the new manager.

**Indianapolis, Ind.**—A sales branch of the Sears-Cross Co., of New York, manufacturer of speed-indicating devices, is being opened in Capitol avenue with W. J. Burdick, of Chicago, as manager.

**Kewaunee, Wis.**—The Haney-Pistor Co. is building a large addition to its garage and sales rooms, which adjoin the Karsten hotel. It will be of concrete construction and have room for fifty cars.

**Boston, Mass.**—A. C. Dow, formerly with the Boston branch of the Haynes Automobile Co., has entered the service of the wholesale department of the Buick Boston Co. as assistant to Mr. Noyes.

**Syracuse, N. Y.**—W. W. Garabrant has been appointed Franklin district sales manager for the states of Nebraska, Kansas, Missouri and Oklahoma. He will make his headquarters at Kansas City, Mo.

**Seattle, Wash.**—Hugh A. Baird, formerly engaged in the motor car business in Seattle, is now conducting a motor supply store at Sixth avenue and Union street and has taken the Seattle agency for Nassau tires.

**Milwaukee, Wis.**—James Suydan, manager of the St. Paul, Minn., branch of the Goodyear Rubber Co., has been appointed manager of the Wisconsin branch at 386-388 East Water street, to succeed Walter W. Wallis, who died recently.

**Boston, Mass.**—W. S. Jewell, formerly district manager for the R. C. H. Co. of New York, has been appointed sales manager of the branch of the Kelly-Springfield Motor Truck Co. in this city. P. S. Aultman will continue as manager.

**Beloit, Wis.**—The Beloit Auto and Machinery Co., an outgrowth of the Fourth Street garage, will erect a two-story concrete garage building, 130 by 60 feet in size. A large warehouse, which will also be used for storing farm implements, will be built in the rear.

**La Crosse, Wis.**—The Hans Motor Equipment Co., a Minnesota corporation capitalized at \$25,000, has filed articles to do business in Wisconsin. This formerly was the National Gauge and Register Co., which moved to La Crosse from Minneapolis a year ago.

**Indianapolis, Ind.**—The Capitol Body Co. has leased the property formerly occupied by the Piel Bros. Mfg. Co. located at Madison avenue and Ray street. The buildings are of brick, containing 41,000 square feet of floor space. Operations will begin not later than March 15.

## Coming Motor Events

### SHOWS

March 8-15.....Boston, Mass.  
March 10-15.....Cedar Rapids, Ia.  
March 11-15.....Buffalo truck show  
March 11-15.....Truck show, Des Moines, Ia.  
March 12-15.....Peoria, Ill.  
March 8-15.....Columbus, Ohio  
March 17-22.....Wilkes-Barre, Pa.  
March 19-22.....Springfield, Ill.  
March 19-25.....Boston, Mass.  
March 20-24.....New Orleans, La.  
March 24-29.....Indianapolis, Ind.  
March 27-April 3.....Quincy, Ill.  
March 31-April 5.....Deadwood, S. D.  
April 1-6.....San Francisco, Cal.  
April 5-12.....Pittsburg, Pa.  
April 13-19.....Pittsburg, Pa., commercial show

### CONTESTS

May 30—Indianapolis speedway meet.  
\*June 25-29—Chicago Automobile Club reliability to Boston, Mass.  
July 12—French grand prix.  
July 1—Indianapolis to Pacific coast tour; promoted by Indiana Automobile Manufacturers' Association.  
\*July 27-28—Tacoma, Wash., road race.  
\*November 25—Vanderbilt road race at Savannah, Ga.  
November 25—Vanderbilt road race at Savannah, Ga.  
November 27—Savannah grand prix.

\*Sanctioned by A. A. A.



# Recent Agencies Appointed by Motor Car Manufacturers

## PLEASURE CARS

Town	Agent	Car
Allentown, Pa.	L. H. Yeager	Rauch & Lang
Athens, O.	George Moon	Marathon
Appleton, Wis.	August Jahnke	Regal
Baltimore, Md.	Zell Motor Car Co.	Rauch & Lang
Burlington, Wis.	Automobile Supply Co.	Regal
Bridgeport, Conn.	Brandegge Auto Co.	Rauch & Lang
Clyman, Wis.	Morgan & Young	Regal
Chicago	J. A. Bender Co.	Keeton
Columbus, O.	Pausch & Selbach Wagon & Auto Co.	Marathon
Dunnell, Minn.	Cooper & Chute	R. C. H.
Darlington, Wis.	A. C. Poole & Sons	Regal
Fond du Lac, Wis.	R. T. Mellis	Regal
Ft. Atkinson, Wis.	Hubbard & Bailey	Regal
Glassport, Pa.	R. C. H. Auto Co.	R. C. H.
Galesburg, Ill.	Mackemer-Pinkerton Automobile Co.	Ford
Hustisford, Wis.	A. R. Grimm	Regal
Kansas City, Mo.	Packard-Kansas City Motor Car Co.	Rauch & Lang
Kansas City, Mo.	H. A. Dougherty	Keeton
Lake Mills, Wis.	W. Gericke	Regal
Lancaster, Pa.	B. G. & A. E. Dodge	Olds
McCull, S. C.	E. L. Adams	Henderson
Meridian, Miss.	Edward S. Curtice & Co.	Olds
Milwaukee, Wis.	P. V. Denster	Henderson
Minneapolis, Minn.	Minnesota Motor Car Co.	Henderson
Macon, Mo.	Macon Garage Co.	Moon
Medapolis, Ia.	Fleener's Garage	Moon
Montclair, N. J.	Montclair Garage & Machine Co.	Moon
Middletown, O.	Radabaugh & Nichols	Crow Elkhart
Mt. Morris, Ill.	J. H. Ricken	Crow Elkhart
Mt. Pleasant, Ia.	G. A. Tolander	Crow Elkhart
Macomb, Ill.	J. R. Binnie	Great Western
Mishawaka, Ind.	Porter H. Crofoot	Great Western
Memphis, Tenn.	Loeb Motor Co.	American
Marquette, Mich.	Cloverland Auto Co.	Chalmers
Montgomery, Ala.	M. W. Stuart & William Berridge	Chalmers
Minot, N. D.	Minot Auto Co.	Chalmers
Marion, O.	C. C. Stoltz	Stevens-Duryea
Manchester, N. H.	Manchester Auto Garage	Dart
Milwaukee, Wis.	H. F. Wiesenthal	Dart
Madison, Wis.	Madison Motor Car Co.	McFarlan
Middletown, Conn.	S. M. Foote	McFarlan
Mitchell, S. D.	Mitchell Auto & Supply Co.	McFarlan
Montreal, Canada	N. A. Racine	McFarlan
Maysville, N. C.	W. M. Euband	Great Western
Marion, Ind.	E. P. McKeivitt	Great Western
Moline, Ill.	Glenn & Trevor	Great Western
Martinez, Cal.	W. W. Morgan	Marathon
Moosejaw, Sask.	Saskatchewan Garage	Kisselkar
Monterey, Mex.	J. F. Austin	Kisselkar
Mt. Vernon, Wash.	Ernest Peterson	Kisselkar
Mineral Point, Wis.	L. A. Ross	Regal
Montello, Wis.	H. A. Freitag	Regal
Monroe, Ore.	A. Wilhelm & Sons	Kisselkar
Mt. View, Cal.	W. A. Platt	Kisselkar
Muscataine, Ia.	Louis E. Helts	Lozier
Mason City, Ia.	J. C. Stoddard	Olds
Napa, Cal.	Anger & Knox	Henderson
New London, Wis.	R. D. Rickady	Crow Elkhart
New Orleans, La.	Swartz & Co.	McFarlan
New Canton, Ill.	J. R. Easley	Great Western
Newark, N. J.	J. C. Kuehne	Great Western
New Brighton, Pa.	H. S. Link	Great Western
Newton, Wis.	L. Franzmeier	Regal
Newton, Ia.	Woody Auto Co.	Marathon
New Britain, Conn.	F. E. Purinton	Marathon
North Yakima		
Wash.	Yakima Auto & Supply Co.	Kisselkar
New Berg, Ore.	S. A. Mills	Kisselkar
Niles, Cal.	E. F. Rose	Kisselkar
New Haven, Conn.	The Holcomb Co.	Lozier
New Windsor, Ill.	A. C. Anderson	Midland
Norfolk, Va.	Allen Motor Co.	Lozier
Oakland, Cal.	W. E. Hall Motor Car Co.	Henderson
Oklahoma C'y, Okl.	Carhart Motor Car Co.	Ohio
Orland, Ill.	Schussler & Ward	Dart
Old Town, Me.	C. B. Swan	McFarlan
Oakland, Cal.	Royce & Burroughs	Marathon
Odebolt, Ia.	Koehler & Hanson Co.	Marathon
Owen Sound, Ont.	Hugo A. Gutenkunst	Kisselkar
Oakland, Ore.	E. E. Leas	Kisselkar
Oakhosh, Wis.	J. Krenn	Regal
Omaha, Neb.	Freeland Auto Co.	Midland
Omaha, Neb.	McIntyre Auto Co.	Dart
Pomona, Cal.	Western Auto Sales & Mfg. Co.	Gr. Western
Philadelphia, Pa.	Geo. Pugh	Henderson
Peoria, Ill.	Frank Le Flem	Henderson
Plymouth, Wis.	Mackemer & Pinkerton	Chalmers
	J. H. Timm Co.	Crow Elkhart

Town	Agent	Car
Pocomoke City, Md.	H. B. Walters Co.	Paige-Detroit
Pittsburgh, Pa.	Martin & Coulter	Dart
Preston, Kan.	Hoffman Brothers	Great Western
Paris, Ill.	Foley Carriage Co.	Great Western
Portland, Ore.	Gerlinger Motor Car Co.	McFarlan
Plymouth, Ind.	Lawrence Brothers	Great Western
Parc Lafontaine, Canada	De Vaux Motor Car Co.	Nyberg
Portsmouth, O.	R. S. Frichard	Great Western
Paris, Tenn.	Paris Auto & Garage Co.	Great Western
Putnam, Ill.	Henkins & Dawson	Marathon
Pittsburgh, Pa.	J. H. McClarren	Marathon
Patterson, N. J.	Taximeter Auto Co.	Kisselkar
Phoenix, B. C.	Morrin-Thompson Co.	Kisselkar
Portage, Wis.	West Grant Auto Agency	Regal
Portage, Wis.	Portage Iron Works	Regal
Pendleton, Ore.	Long Brothers	Paige-Detroit
Paso Robles, Cal.	E. T. Neal	Kisselkar
Placerville, Cal.	F. K. Davis	Kisselkar
Pleasanton, Cal.	J. S. Gill	Kisselkar
Powellton, Ill.	J. B. Monroe	Staver
Panora, Ia.	J. R. Pearson	Marathon
Quitman, Ga.	Blue Ribbon Garage	Henderson
Rosenburg, Tex.	Rosenburg Auto Co.	Moon
Rock Island, Ill.	Dennes and Kuttler Machine Co.	Marathon
Roseberg, Ore.	John Gray	Kisselkar
Rochester, N. Y.	Junker Brothers	Staver
Red Bank, N. J.	Edward Von Kattengell	Lozier
Roanoke, Va.	Hunter Motor Co.	Lozier
Reading, Pa.	D. F. Hoffer & Sons	Olds
Rimersburg, Pa.	E. M. & S. M. Kaster	Marathon
Reno, Nev.	Western Auto Supply Co.	Kisselkar
Roodhouse, Ill.	I. L. Lemmon	Crow Elkhart
Ravenwood, Mo.	Emmett Bishop	Great Western
Rochester, N. Y.	J. Fred Weber	American
Rock Island, Ill.	Trevor & Snider	Chicago
Redcliff, Can.	F. F. Woodcock	Cartercar
Rochester, N. Y.	Mandery Motor Car Co.	Ohio
Roseland, Ill.	D. Van Wyngarden	Franklin
Republic, O.	Womer & Ink	Paige-Detroit
Racine, Wis.	Paul & Brietzke	Regal
Rochester, N. Y.	Carthage Motor Car Co.	McFarlan
Riverton, N. J.	C. T. Woolston	Great Western
Pana, Ill.	Julius Broehl	Great Western
St. Louis, Mo.	Marion Motor Sales Co.	Marion
St. Louis, Mo.	American Welding & Auto Repair Co.	Midland
St. Louis, Mo.	M. W. Bond Automobile Co.	Empire
Sheboygan, Wis.	E. H. Motor Co.	Regal
St. Louis, Mo.	Rauch & Lang Co.	Rauch & Lang
South Bend, Ind.	A. J. Diermeyer	R. C. H.
Spokane, Wash.	Consolidated Auto Co.	Paige-Detroit
Shamokin, Pa.	Edgewood Garage	Olds
Schaller, Ia.	E. F. Hasseler	Moon
St. Louis, Mo.	General Motor Car Co.	American
San Antonio, Tex.	C. H. Dean	Crow Elkhart
Salt Lake City, Utah		
St. Louis, Mo.	Cartercar Utah Co.	Cartercar
St. Louis, Mo.	Werber Motor Truck Co.	Dart
San Juan, P. R.	L. Planas Marti	Dart
San Jose, Cal.	O. A. Thompson	Marathon
Santa Cruz, Cal.	Walt, Schilling & Co.	Marathon
Sheldahl, Ia.	Heitz & Mosbach	Marathon
St. Paul, Neb.	Albert Peterson	Marathon
Smith Center, Kan.	A. R. Joy & Mead	Marathon
Stockholm, Sweden	C. R. Miller	Kisselkar
St. Augustine, Ill.	Babbitt & Stevens	Marathon
St. Helena, Ore.	McCoy & Vezzie	Kisselkar
Salem, Ore.	C. L. Rose Co.	Kisselkar
San Mateo, Cal.	Wisnom-Bonner Hardware Co.	Kisselkar
Santa Cruz, Cal.	T. W. Thomson	Kisselkar
St. Louis, Mo.	T. J. Moss Motor Car Co.	Staver
San Antonio, Tex.	F. D. Schultze	Olds
Sterling, Ill.	Greenough & Pittman	Olds
Shreveport, La.	Ernest R. Bernstein	Olds
St. Louis, Mo.	American Welding Co.	Midland
San Antonio, Tex.	Clifton George	Midland
Sunbury, Pa.	A. W. Pontius	Lozier
Seattle, Wash.	Washington Cartercar Co.	Cartercar
Spokane, Wash.	Frescott Automobile Co.	Cartercar
Sabina, O.	Charles McKay	Great Western
Sauemin, Ill.	C. R. Holdridge	Great Western
St. Louis, Mo.	Collier-Reitz Motor Car Co.	McFarlan
San Juan, P. R.	Pan-American Trading & Supply Co.	Great Western
San Francisco, Cal.	Inter-State Motors Co.	Great Western
Seward, Neb.	Seward Automobile Co.	Great Western
St. Louis, Mo.	Albert Sterne	Great Western
Seattle, Wash.	Pacific Car Co.	Paige-Detroit
Tama, Ia.	Dr. B. Thompson	Marathon
Turlock, Cal.	Brooks Auto Co.	Kisselkar

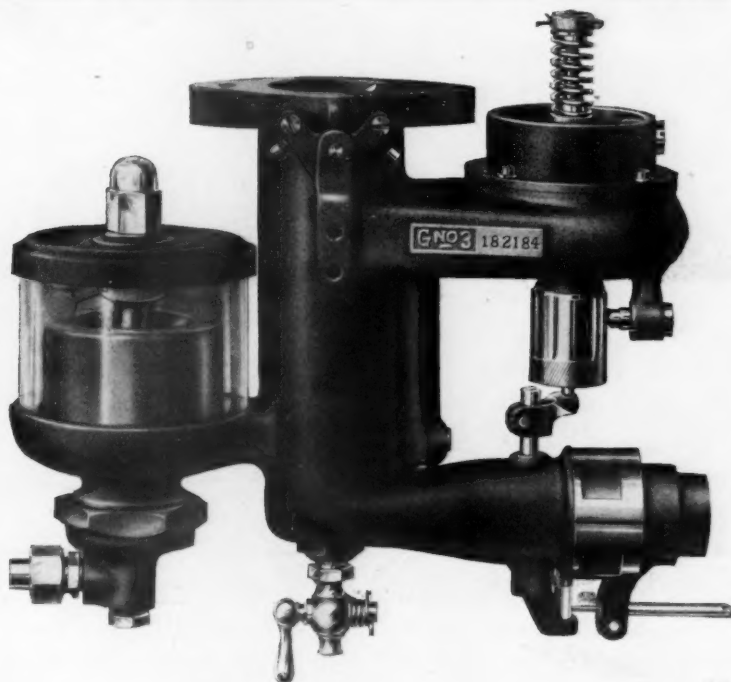
## TRUCKS

Atlantic City, N. J.	Eastern Motor Co.	Stewart
Albany, N. Y.	Albany Garage Co.	Stewart
Akron, O.	Middlebury Garage	Stewart
Birmingham, Ala.		Kelly-Springfield
Buenos Ayres, Ar.	gentine Republic Pratt & Co.	Stewart
Calgary, Alta.	The Motor Power & Transit Co.	Stewart
Cleveland, O.		Kelly-Springfield
	Kelly-Springfield Motor Truck Co.	
Dallas, Tex.		Kelly-Springfield
	Kelly-Springfield Motor Truck Co.	
Fall River, Mass.	Robert W. Powers	Stewart
Gd. Rapids, Mich.	The Overland Co.	Stewart

Hartford, Conn.	Capitol City Auto Co.	Stewart
Los Angeles, Cal.	Stewart Auto Sales Co.	Stewart
Montreal, Can.	Ralph Careu	Stewart
Medford, Mass.	Ross Maddocks	Stewart
Medicine Hat, Alta.	Medicine Hat Garage	Stewart
Newark, N. J.	Edward McK. Hunt	Stewart
San Francisco, Cal.	S. G. Chapman	Stewart
St. Louis, Mo.	Mogul Motor Truck Co.	Mogul
Seattle, Wash.		Kelly-Springfield
	Kelly-Springfield Motor Truck Co.	
Pittsburg, Pa.	Alco-Pittsburg Sales Co.	Stewart
White Plains, N. Y.	Chas. F. Brown	Stewart
Washington, D. C.	David S. Hendrick Co.	Stewart

# STROMBERG Model "G"

"The Little Six Carburetor"



A STROMBERG Carburetor built to meet economically the demands of small six-cylinder motors. This is a non-water jacketed, double jet model—built along the standard lines of Stromberg Carburetors with high and low speed adjustments—glass float chamber—new direct acting float mechanism—extended venturi—hot air horn and a new simple dash or steering post control.

Type "G" can also be used as a single jet carburetor, and as such gives remarkable service on small or medium size four-cylinder pleasure cars or trucks.

Insist on a Stromberg on your new car. Install one now on your old car.

**Stromberg Motor Devices Company**

64-68 East 25th Street, Chicago, Ill.

BRANCHES:

New York    Boston    Detroit    Indianapolis    Minneapolis    San Francisco

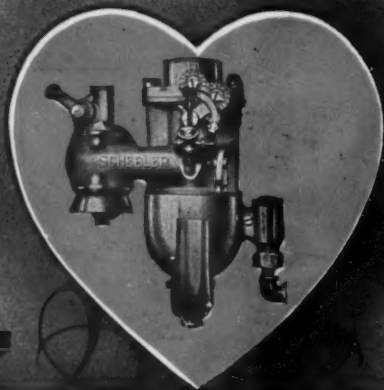
Canadian Distributors: Russell Motor Car Company, Toronto.  
Pacific Coast Distributors: Chanslor & Lyon Co., San Francisco.





# SCHEBLER

*The Aristocrat  
of Carburetors*



*"The Heart of the Automobile"*

## WHEELER & SCHEBLER

"Pioneers in Perfection" of Carburetion

MANUFACTURERS  
INDIANAPOLIS U.S.A.

### THE SCHEBLER IS THE ACKNOWLEDGED STANDARD CARBURETOR OF THE WORLD

#### *Branches*

NEW YORK  
BOSTON  
PHILADELPHIA  
ATLANTA  
MINNEAPOLIS  
KANSAS CITY  
CHICAGO

DETROIT  
DENVER  
SAN FRANCISCO  
LOS ANGELES  
SEATTLE  
MONTREAL CAN.  
SIDNEY AUSTRALIA

#### *Service Department*

#### *Distributors*

Every city and town in  
the United States and  
Canada • Europe and  
• Australia •

# "THE" CARS

A. E. C.  
Alco  
Armleder  
Autocar  
H. H. Babcock  
Bailey  
Benz  
Borland Electric  
Broc Electric  
Buffalo Electric Roadster  
Charon (European)  
Chicago Electric  
Church-Field Electric  
Cole (Special)  
Columbia  
Davis  
F. I. A. T.  
Flanders  
Hudson (Special)  
King  
Knickerbocker  
Knox  
Lancia (European)  
Lozier  
Marmon  
Matheson  
Metallurgique  
Multiplex  
National  
Nyberg  
Oakland  
Oldsmobile  
Orson  
Packard (Special)  
Pierce-Arrow  
Pope Hartford  
Pratt  
Schneider (European)  
Simplex  
Staver  
Stearns  
Sternberg  
Stevens-Duryea  
Stoddard-Dayton  
Touraine  
Guy Vaughn  
Walker Electric  
Ward  
White

THIS LIST of 49 cars represents the aristocracy of motordom. Read it over. How many high-grade cars do you fail to find?

Select any one and you buy a car Klaxon-equipped;—one that the maker intends shall be *completely ready*—for your comfort, safety, satisfaction.

You buy a car equipped with a signal that is the out-and-out choice of over 150,000 motorists; that is *necessary* to public safety; and that fully meets the measure of efficiency laid down by all signal laws and ordinances.

The concerted action of the high-grade car manufacturers of this country and Europe is the final stamp of disapproval upon the out-of-date, inadequate bulb-horn.



Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

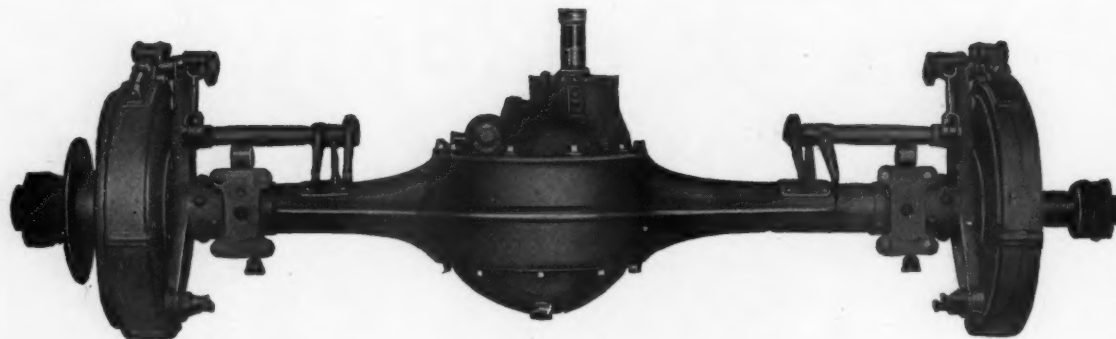
## KLAXON

"The Public Safety Signal"





# American Axles



## Their Essential Features Are Patented Features

Your car is only as safe as its axles are dependable.

The marvel of the motor car—its ability to make with security upon the rough highway the speed with which an express train glides on steel rails—is largely a matter of axle efficiency. Or—to make the analysis complete—of axle durability, axle silence and axle efficiency.

And these three requisites are dependent upon the correctness of the design; upon the experience of the workmen, and the mechanical equipment engaged in the execution of that design.

In the case of the *American Axle*, the essential features of construction by which these three all-important characteristics are secured, are patented features.

Moreover, some of these patents are so fundamental and so inclusive in scope, that they may be accepted as literal definitions for axle construction embodying the three qualities: durability, silence and efficiency.

Your car should have *American Axles* because their efficiency spells economy to you.

**The American Ball-Bearing Company**  
**Cleveland, Ohio**

# Automobile Manufacturers Who Use



## Storage Batteries

# Exclusively

## For Starting or Lighting or Both

Abbott Motor Co.	Detroit, Mich.	McLaughlin Motor Car Co.	Oshawa, Ont.
American La France Fire Eng. Co.	Elmira, N. Y.	Mercer Automobile Co.	Trenton, N. J.
American Locomotive Co.	Providence, R. I.	Marion Motor Car Co.	Indianapolis, Ind.
American Motors Co.	Indianapolis, Ind.	Martindale & Millikin	Franklin, Ind.
Ames Motor Car Co.	Owensboro, Ky.	Maxwell Motor Car Co.	Detroit, Mich.
Apperson Bros. Automobile Co.	Kokomo, Ind.	Metzger Motor Car Co.	Detroit, Mich.
O. Armleder Co.	Cincinnati, Ohio	Michigan Buggy Co.	Kalamazoo, Mich.
Auburn Automobile Co.	Auburn, Ind.	Midland Motor Car Co.	Moline, Ill.
Bartholomew Co.	Peoria, Ill.	Moline Automobile Co.	East Moline, Ill.
Buckeye Mfg. Co.	Anderson, Ind.	Moon Motor Car Co.	St. Louis, Mo.
Canadian Standard Auto & Tract. Co.	Ft. Wayne, Ind.	Motor Car Mfg. Co.	Indianapolis, Ind.
Cartercar Co.	Pontiac, Mich.	Marathon Motor Co.	Nashville, Tenn.
J. I. Case T. M. Co. Motor Works	Racine Jct., Wis.	Nance Motor Car Co.	Philadelphia, Pa.
Chadwick Engineering Works	Pottstown, Pa.	National Motor Vehicle Co.	Indianapolis, Ind.
F. Coleman Carriage & Harness Co.	Ilion, N. Y.	Nordyke & Marmon Co.	Indianapolis, Ind.
Columbus Buggy Co.	Columbus, Ohio	Norwalk Motor Car Co.	Martinsburg, W. Va.
Commerce Motor Truck Co.	Detroit, Mich.	Nova Scotia Carriage Co.	Kentville, N. S.
Corbitt Automobile Co.	Henderson, N. C.	Paige-Detroit Motor Car Co.	Detroit, Mich.
Crawford Automobile Co.	Hagerstown, Md.	Paterson Wagon Works	Flint, Mich.
Crescent Motor Co.	Cincinnati, Ohio	Peerless Motor Car Co.	Cleveland, Ohio
Crow Motor Car Co.	Elkhart, Ind.	Pilot Motor Car Co.	Richmond, Ind.
Jas. Cunningham Son & Co.	Rochester, N. Y.	Pope Mfg. Co.	Hartford, Conn.
Cutting Motor Car Co.	Jackson, Mich.	Premier Motor Car Co.	Indianapolis, Ind.
Croxton Motor Car Co.	Washington, Pa.	Pullman Motor Car Co.	York, Pa.
Geo. W. Davis Carriage Co.	Richmond, Ind.	Regal Motor Car Co.	Detroit, Mich.
Enger Motor Car Co.	Cincinnati, Ohio	Reo Motor Car Co.	Lansing, Mich.
Elkhart Carriage & Harness Co.	Elkhart, Ind.	Reo Motor Car Co. of Canada	St. Catharines, Ont.
F. I. A. T. Company	Poughkeepsie, N. Y.	Russell Motor Car Co.	W. Toronto, Ont.
Flanders Motor Co.	Detroit, Mich.	Schacht Motor Car Co.	Cincinnati, Ohio
H. H. Franklin Mfg. Co.	Syracuse, N. Y.	Seagrave Co.	Columbus, Ohio
Gramm-Bernstein Co.	Lima, Ohio	Selden Motor Car Co.	Rochester, N. Y.
Gramm Motor Truck Co.	Lima, Ohio	Simplex Automobile Co.	New Brunswick, N. J.
Gramm Motor Truck Co.	Walkerville, Ont.	A. O. Smith Co.	Milwaukee, Wis.
Great Western Automobile	Peru, Ind.	Speedwell Motor Car Co.	Dayton, Ohio
Haberer & Co.	Cincinnati, Ohio	Stanley Motor Car Co.	Newton, Mass.
Havers Motor Car Co.	Port Huron, Mich.	F. B. Stearns Co.	Cleveland, Ohio
Haynes Automobile Co.	Kokomo, Ind.	Stevens-Duryea Co.	Chicopee Falls, Mass.
Henderson Motor Car Co.	Indianapolis, Ind.	Stoddard-Dayton Co. (Maxwell)	Dayton, Ohio
Herreshoff Motor Co.	Detroit, Mich.	Studebaker Corporation	Detroit, Mich.
Ideal Motor Car Co.	Indianapolis, Ind.	Touraine Motor Car Co.	Philadelphia, Pa.
Imperial Automobile Co.	Jackson, Mich.	The Tudhope Motor Car Co.	Orillia, Can.
Jackson Motor Car Co.	Jackson, Mich.	Velie Motor Vehicle Co.	Moline, Ill.
King Motor Car Co.	Detroit, Mich.	Warren Motor Car Co.	Detroit, Mich.
Kline Motor Car Co.	Richmond, Va.	Wayne Works	Richmond, Ind.
Knox Automobile Co.	Springfield, Mass.	Webb Co.	Allentown, Pa.
Lenox Motor Car Co.	Boston, Mass.	Westcott Motor Car Co.	Richmond, Ind.
Lexington Motor Car Co.	Connersville, Ind.	White Company	Cleveland, Ohio
Locomobile Company of America	Bridgeport, Conn.	Wichita Falls Motor Co.	Wichita Falls, Tex.
Lozier Motor Car Co.	Detroit, Mich.	Winton Motor Car Co.	Cleveland, Ohio
W. H. McIntyre Co.	Auburn, Ind.	Zimmerman Mfg. Co.	Auburn, Ind.

# NEED WE SAY MORE?

## Willard Storage Battery Co. Cleveland, Ohio





# This Sign



Now Displayed by Leading  
Dealers and Garages

FLAT CHEVRON STEEL STUD



**Indestructible**

## ENGLEBERT TYRES

*Made in Belgium*

European manufacturers are conservative and slow to give their unqualified endorsement to a product before they have thoroughly investigated it.

ENGLEBERT TYRES are being used by thousands of satisfied motorists in Europe because they have proved by actual performance that they will not blow out or rim cut. They are being adopted as standard equipment by the leading European manufacturers, because of the quality of their rubber, the honesty of their construction and the tire mileage that they actually give.

ENGLEBERT TYRES cost no more in the initial outlay than any American made tire, and they give 50 per cent more tire satisfaction.

All that the tire industry knows is built into the ENGLEBERT TYRE.

### ENGLEBERT TYRE COMPANY

E. W. ELVERSON, President and General Manager, 1916 Broadway, New York City.

Sole American Representatives of O. Englebert Fils & Cie., Liege, Belgium

CHICAGO BRANCH — 2420 Michigan Avenue

**LIVE DEALERS**—Some desirable territory yet to be allotted!

# HOLLEY

## CARBURETOR

**Most Expensive!**  
**Yes, But—**

the new self-adjusting Holley cannot be compared with any other American carburetor.

It is built on a different principle—a new one.

It has no moving parts only one adjustment.

Accurate temperature regulator included, which makes it particularly efficient in winter.

In its construction, all balls, springs, cams and other complicated and variable adjustment devices have been eliminated.

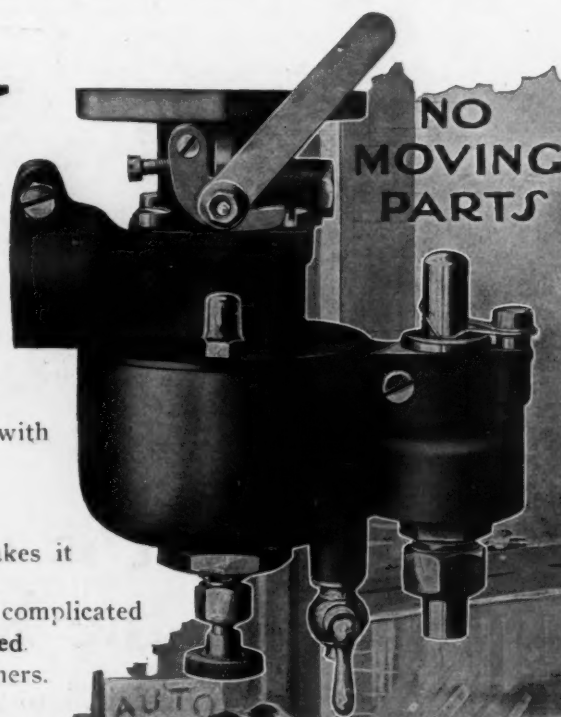
This Holley carburetor is two years ahead of all others.

Watch the others copy it.

Sixteen of the large motor car manufacturers use it now.

Over 200,000 sold for 1913 delivery

Write for booklet "A New Principle in Carburetors."



**Holley Brothers Company**  
Detroit, Michigan



Holley Carburetors are carried in stock at the following addresses:

**CHAS. E. MILLER**

HOME OFFICE: 97-99-101-103 Reade St. and 121 Chambers St., New York City

### BRANCHES:

**NEW YORK CITY**  
924 Eighth Avenue  
Bet. 54th & 55th Sts.

**NEW YORK CITY**  
2782 Broadway  
Bet. 107th & 108th Sts.

**BROOKLYN, N. Y.**  
1421 Bedford Avenue

**BUFFALO, N. Y.**  
824 Main Street  
**ALBANY, N. Y.**  
135 Central Avenue

**BOSTON, MASS.**  
202-204 Columbus Ave.

**SPRINGFIELD, MASS.**  
Bridge and Dwight Sts.  
**HARTFORD, CONN.**  
274 Trumbull Street

**DETROIT, MICH.**  
227-229 Jefferson Avenue

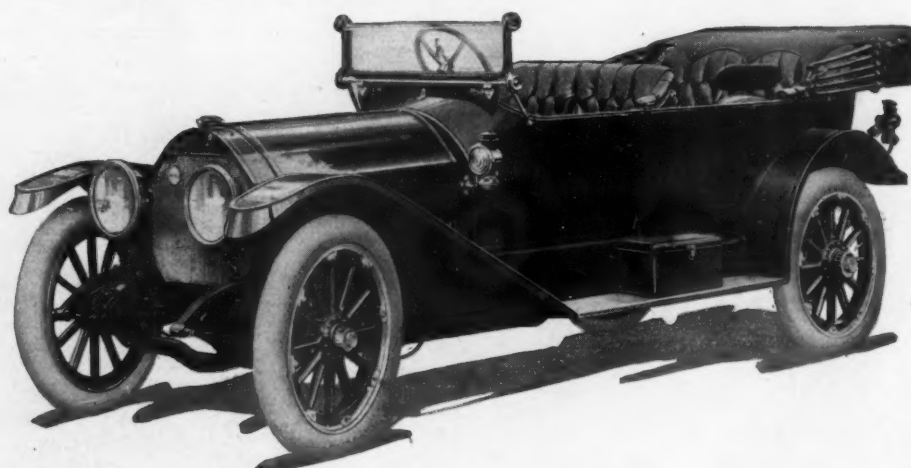
**CLEVELAND, O.**  
1829 Euclid Avenue  
**PHILADELPHIA, PA.**  
318 North Broad St.

**ATLANTA, GA.**  
66 Edgewood Avenue

**NEW ORLEANS, LA.**  
601-603 Baronne Street  
**NEWARK, N. J.**  
274 Halsey Street

When Writing to Advertisers, Please Mention Motor Age.





## Comfort is engineered into the KisselKar

**C**OMFORT is built into the KisselKar, not merely added on. The aim of KisselKar design has been to prevent the undue side lurches, sways and shocks of road travel, not merely to modify them by spring action and upholstery.

Ride in a KisselKar—you will discover how this fundamental comfort engineered into the KisselKar, plus all the added refinements of comfort, brings a new mildness to motoring—a steadier, lighter motion, free from sways and lurches—a riding ease that immeasurably surpasses ordinary ideas of car comfort.

# KISSELKAR

The balance of the KisselKar makes it exceptionally sensitive to the steering wheel, and agile in picking the road. The flexible motor does away with the gear-shifting in ordinary driving, enabling you to drive as slow as needed, and climb hills on fourth geared up speed. "Thirty" \$1700—"Forty" \$2000—"Fifty" \$2500—60 H. P. "Six" \$3150. Electric Started and Lighted—fully equipped.

**Write for big illustrated catalog**—The 1913 KisselKar Catalog illustrates the entire KisselKar line of pleasure models, and describes KisselKar design and construction. It will give you a new standard by which to judge automobile values.

**KisselKar Trucks**—1500 lb., 1, 1½, 2, 3, 4, 5 ton Trucks, Delivery Cars, Fire Dept. Apparatus, Ambulances, Police Patrols, Hearses

**Kissel Motor Car Co., 121 Kissel Ave., Hartford, Wis.**

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY  
LOS ANGELES MINNEAPOLIS ST. PAUL DALLAS  
Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, Calgary and 200 other principal points throughout America.

# Warner

## AUTO-METER

(MAGNETIC PRINCIPLE)

**T**HE Warner Auto-Meter has been successful in exact proportion to its accuracy as a speed and mileage indicator.

Being built on the only scientifically correct principle (magnetic) it has rendered such unfailingly accurate service, for so many years, that now over 98% of all the high priced cars to be manufactured for 1913 will carry it as standard equipment.

*Please Address Dept. 1*

**Warner Auto-Meter Factory, Beloit, Wisconsin**

*Branches in all principal cities a.l over the world*



Model O-2  
Price \$145

*When Writing to Advertisers, Please Mention Motor Age.*



# AN OPEN LETTER FROM



MAXWELL MOTOR COMPANY

INCORPORATED

DETROIT, MICHIGAN

March 8, 1913

Gentlemen:-

There seems to be a lot of misunderstanding with regard to the manufacturing and sales policy of the new Maxwell Motor Company.

This misunderstanding is largely due, doubtless, to a lot of misinformation that has been diligently circulated by competitors.

Their reasons for desiring to impede the progress of the re-organized company are apparent--they do not welcome such competition as we purpose giving them.

So their attitude is natural--and we don't mind.

We might have stopped a lot of the talk some time ago had we considered it worth while to tell our story. But we didn't.

It was not our time to talk--it was ours to work--to plan--to produce.

According to my idea, the time for the manufacturer to talk is when he is ready to deliver the goods. In times past we might have saved our office force a lot of work had we observed that rule. This time we have done so.

I think I know what you want.

I think you know we can produce that kind of a line.

That being the case, we have just gone ahead sawing wood--disposing of such plants and equipment as we could not use to advantage, and re-arranging and re-equipping the others preparatory to building cars in quantities.

Meantime, our engineers have been busy. They have had before them every car with which they will have to compete. Their task was to beat them all.

A big task, you'll say: Yes, but that's the kind of men who comprise this organization.

I figured--and I think the future will bear me out-- that our best plan was to keep quiet while the other fellow talked himself out.

# MR. FLANDERS TO DEALERS

2.

He has shot his bolt. He has said all he can say--and now is ashamed of most of it. He's apologizing now--so we'll leave him in that position.

Meantime, we've followed Teddy's precept, "step softly but carry a big stick."

Talk on our part would have accomplished nothing. We had no apologies to make--no goods to deliver--so why waste time talking.

That you as a dealer are interested in is a line of cars that will compete-- that will sell easier, and to which you can tie for permanency and profit.

Am I right?--all right. We have that line. And, our sales policy will suit you too well to suit our competitors!

I have always maintained that marketing the product is the big problem in business. Manufacturing is a problem in acreage-- in capital, in machines, and men.

Most of my business life has been spent in selling. I think I know your problems.

And we need you to make this business a success.

We are going to need a lot of good dealers to sell the quantities of automobiles we are going to make. And we are going to need you more and more as the years go by--as competition gets keener and as manufacturing margins get smaller.

How are we going to get you-and keep you? That is our problem.

I think I know--I think I have worked it out so it will mean more to you to come with us, and more to you to stay with us than to go elsewhere or handle any other line.

Are you interested? Then read the series of open letters we will publish from week to week in this space. In those letters I will treat frankly and fully with every phase of the subject. Frankly and fully.

It's our time to talk now--for we have the goods and are about ready to deliver.

Yours very truly,

MAXWELL MOTOR COMPANY (Inc)

*Walter E. Flanders.*

President and General Manager.





**"Wouldn't be Without Them!"**

***The Unanimous Verdict of Chauffeurs  
Who Have Used Weed Chains for Years***

"Supremacy of the Weed tire chain over all anti-skid devices is proclaimed by chauffeurs in the employ of Chicago's most prominent business men," says one of Chicago's leading newspapers in an editorial in one of their issues in January: "In an effort to ascertain the extent of the popularity enjoyed by the Weed Chain, an investigation was made among the drivers for men who, by virtue of their financial standing, demand as safety equipment for their respective cars the best that money can buy. The replies formed a unanimous verdict in favor of Weed Tire Chains. They were a testimonial of which the company may well be proud, an indication of the way they are regarded in all parts of the country."

**The Only Safeguard Against Skidding**

"There is only one safeguard in slippery weather against the danger of skidding," declares John Anderson, chauffeur for John R. Thompson, wholesale grocer, "that safeguard is the Weed tire chain. As a matter of fact, we never have used any other make of anti-skid device. The chains are far from being expensive, the satisfaction and safety to be gained from their use far overshadowing the expense."

Merrill W. Keister, who drives for John J. Mitchell, President of the Illinois Trust and Savings Bank, says "That during the past eight years his cars have been equipped with Weed Chains and

there never has been a suggestion or a thought of changing the equipment. "We certainly are satisfied with the Weed Chains."

"For my part I wouldn't be without Weed Chains," declares Charles Huff, chauffeur for J. Ogden Armour, the packer. "In fact Weed Chains make the cars as immune from skidding as human intelligence can make them."

Albert Larson and John Carter are chauffeurs for Edward Morris, the packer. "During the past nine years I have driven cars equipped only with Weed Chains," says Carter, "and there may be other anti-skid devices that are 'just as good,' but if there are I never have seen them."

**Weed ANTI-SKID Chains**

***For Your Own Safety—For the Safety of the Public***

One of the greatest dangers known to motorists is *skidding*. Nothing will make a man "lose his nerve" so completely as a bad skid. Many a car has been smashed, many a life has been sacrificed—and unnecessarily so—in skidding accidents. With such a big investment in expensive cars, with the lives of so many women and children at stake and in your care you cannot afford to take chances and foolishly depend on rubber alone for your own safety or for the safety of the public.

Weed Chains are as "necessary as gasoline" as brakes, or as oil, so insist that they be included in the standard equipment of your next car.

**WEED CHAIN TIRE GRIP COMPANY, New York**

Manufactured in Canada by  
**DOMINION CHAIN CO., Head Office, 40 Park Ave., Montreal, Canada**



**Stock  
Champion**

**International  
Champion**

# National

**Five Models \$2750 to \$3400**



**LUXURY AND UTILITY**

**Electric  
Self Starter**

**Center  
Control**

**Electric  
Lights**

**Left Side  
Drive**

**T**HE NATIONAL car is the epitome of years work to combine luxury and everyday reliable service. Twelve years of concentration guarantees your noiseless, convenient National car.

Beneath the surface beauty is perfection in design and materials—dependability, stamina and flexible power that is indefatigable.

Long stroke motor (4 $\frac{7}{8}$  x 6), left-side drive, center control, Gray & Davis electric starter, Gray & Davis dynamo electric lighting system, Bosch double dual magneto, multiple jet carburetor, 12-inch Turkish upholstery, tire pump integral part of motor, 128-inch wheelbase, Hoffeecker speedometer, full floating rear axle, concealed baggage compartments, tire carriers, full heavy nickel trimmings, powerful brakes, perfect oiling system, robe rail, foot rest, foot mat in running board, concealed tool box, electric horn, top, curtains, Truffault-Hartford Shock Absorbers in rear, adjustable ventilating and rain vision windshield.

*Book of Photographic Reproductions Sent Upon Request*

**NATIONAL MOTOR VEHICLE CO., Indianapolis, Ind.**

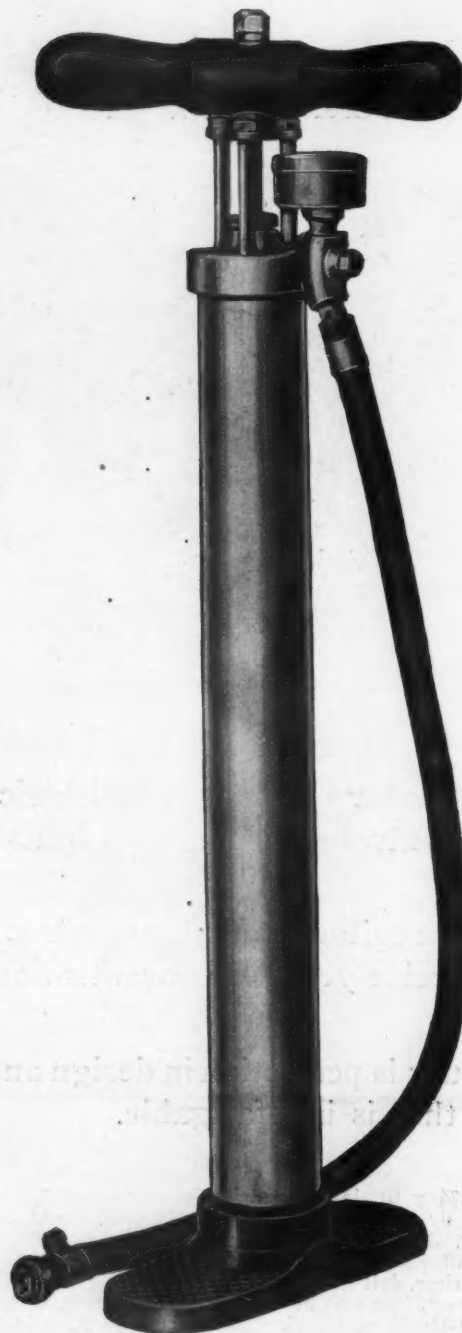
*When Writing to Advertisers, Please Mention Motor Age.*



Distinctly Better Than Any Other Pump

# STAPLEY TIRE PUMP

Made by Bridgeport Brass Works



The STAPLEY is a real tire pump. Strong and sturdy. The workmanship is excellent. This pump inflates the largest tire quickly and easily — a few strokes and the job is done.

The STAPLEY has seamless brass tube cylinders — mark that. It can't rust. Has heavy cast base—won't break. So designed that it won't leak—no wasted effort. Accurate tire pressure gauge—if you want it.

If your dealer doesn't carry it, we will send the STAPLEY prepaid in U.S. on receipt of price  
With Gauge, \$6.00; Without Gauge, \$4.00

**BRIDGEPORT BRASS COMPANY**

P. O. STATION A

BRIDGEPORT, CONN.

*When Writing to Advertisers, Please Mention Motor Age.*

# You Need This New Product— It Heals Tire Cuts



Actual Tube  
twice this size



*The Motorist's  
Self-Vulcanizer*

*Unlike ordinary  
tire repair mastic*

Fills the cuts and holes, solidifies quickly and becomes like a part of the tire. No car owner can afford to be without it. Reduce tire expense fifty per cent.

Use

**Requires no  
Kneading**

**NARCO  
TIRE CUT  
FILLER**

**Very large tube  
one dollar.**

a non-shrinking, rubber compound, heavy in rubber; a combination cement, cut filler and mastic. Refills and unites the torn place in the tire with a permanent plug of rubber more resilient than the tire itself. Welds the loosened tread to the canvas body. Supplied only in patent, collapsible tubes, with tapering spout.

## Easy to Use

All you have to do is to clean the cut out thoroughly with gasoline—remove all oil, sand and other foreign matter; insert the tapering spout into the cut and compress the tube, smooth off the cut filler and the repair is completed. Allow it to heal over night; in the morning it will have become *like a part of the tire*. Rivets itself to the walls of the cut, forming a union so perfect no road abuse can remove it.

This is the logical manner of tire repair. Every automobile owner in America should make Tire Cut Filler a part of his repair outfit and begin saving in tire cost *now*. Very large tube, \$1.00. Money refunded if not satisfied.



**TIRE NEW**

**Narco Rubber Reviver  
and Refinisher**

a reviver, refinisher and waterproofer for anything rubber or fabric. Make your auto tops like new.

waterproofs the outer rubber casing of the tires and penetrates down to the inner fabric, protecting it from oil, air and moisture. Preserves the tires and prevents decay. Spread it over the surface of your tires after mending with Tire Cut Filler. *Makes tires look like new.*

*There are imitations which paint but don't protect—insist on Tirenew.*

**Narco Triple-Strength,  
Non-Inflammable Rubber Cement**

A rubber cement three times as strong as ordinary cement, and costs no more.

**ALL GOOD DEALERS CARRY NARCO PRODUCTS OR WILL GET THEM FOR YOU**

**To Dealers—** Write for the Narco catalog telling all about the complete line of Narco products and don't fail to ask for our trade proposition. We will give you complete information together with our catalog if you will write us mentioning your jobber's name.

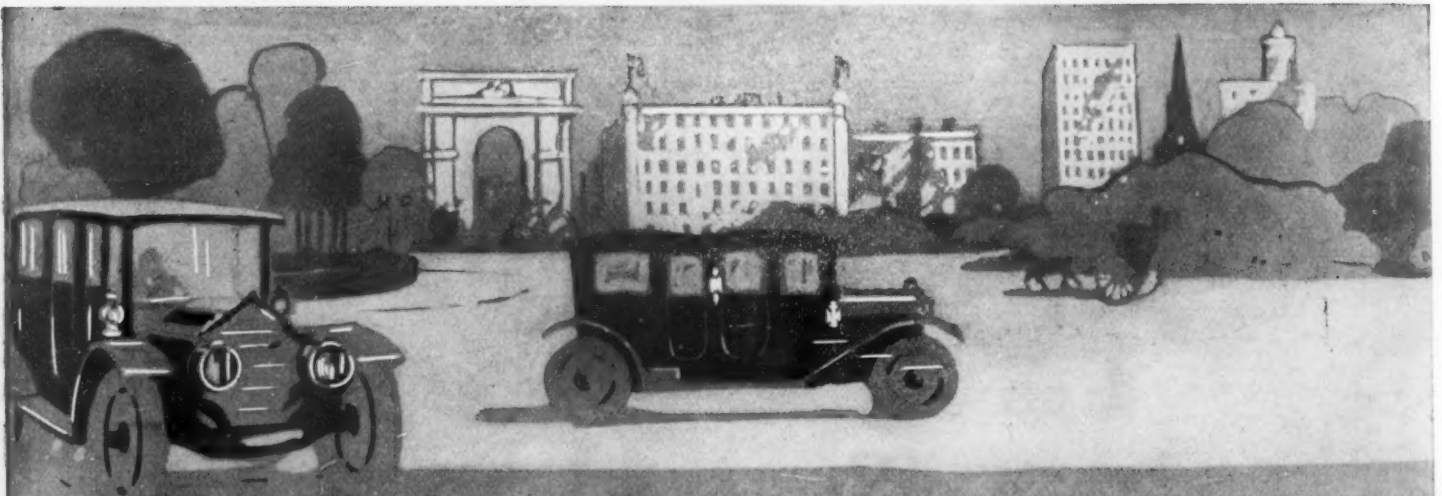
**NATIONAL RUBBER COMPANY**

441 PAPIN STREET,

ST. LOUIS, MO.

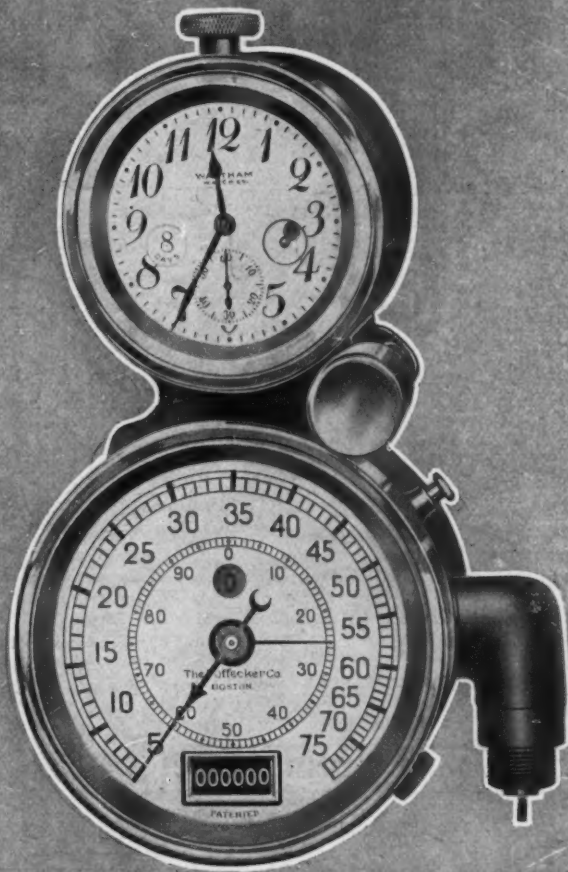
**National Rubber Co., 441 Papin Street, St. Louis.**  
Gentlemen: Enclosed find \$1.00 for which please send me prepaid a large tube of **NARCO TIRE CUT FILLER**.  
Also please send me information regarding Tirenew and your other Narco Products.  
Dealer's name \_\_\_\_\_  
Jobber's name \_\_\_\_\_  
Address \_\_\_\_\_  
My Name \_\_\_\_\_  
Address \_\_\_\_\_





"THE STEADY HAND"

# HOFFECKER SPEEDOMETER



"Hoffecker" on a speedometer has gained the same place in the confidence of the public as "sterling" on silverware.

This confidence springs from a knowledge of the soundness of Hoffecker principles and the true worth of Hoffecker construction.

Write for our catalog.

## THE HOFFECKER CO.

Main Offices:  
MOTOR MART, BOSTON, MASS.  
New York Philadelphia Pittsburgh Cleveland  
Los Angeles San Francisco

Regular Equipment  
on  
NATIONAL, APPERSON  
and  
LENOX CARS



"THE JEWELLED"

# WALTHAM

✦ TIMEPIECE ✦

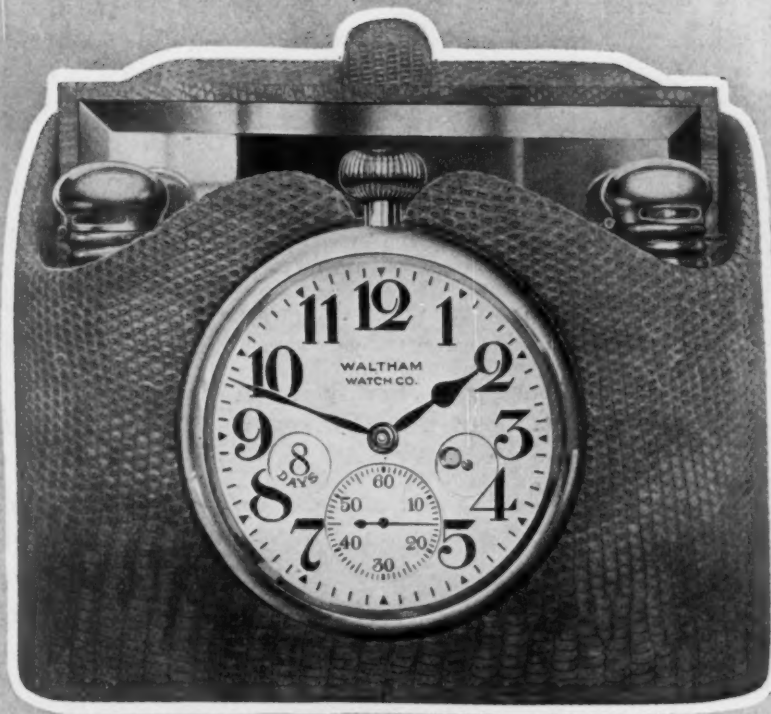
The Waltham eight day timepiece for automobiles is a true member of the famous Waltham watch family. It is built to Waltham standards and its accuracy is thus assured.

It is the one eight day automobile timepiece made with fifteen jewels and adjusted to temperature.

It is built to withstand the hard usage imposed by all conditions of automobile traffic.

Write for further information.

THE WALTHAM WATCH CO.  
WALTHAM MASS.







AT YOUR DEALERS  
*C. A. Mezger*  
**"SOOT PROOF"**  
**SPARK PLUGS**  
 Or from us direct  
**BUT GET THEM**



We want every car owner who has been up against Spark Plug troubles to investigate, through trial, the Mezger Soot Proof Spark Plugs—the plug that is absolute and unlimited insurance against short circuit, leakage and breakage—the plug that *actually cleans itself*.

Complete short circuit and weak spark are almost invariably caused by deposits of carbon in the chamber of the plug. Mezger's patented design does away with this evil.

And this same scientific design actually caused the plug to burn up soot as fast as it forms.

Try this experiment:

Take a Mezger Soot Proof Spark Plug, hold it over an oil lamp, torch, candle, or any light that will quickly deposit carbon. see that it is thoroughly blackened inside, then put it on the cylinder, start your engine, and almost instantly it will be as clean as a plug from the factory.

Subject it to such pressure as you will, you will find it absolutely gas tight.

Abuse it with heat and sudden temperature changes at your pleasure—the porcelain will not crack, and a cracked porcelain is a certain cause of short circuit.

Make the plug prove these claims. They are backed by years of usefulness. Millions of them are today working consistently year in and year out on hundreds of thousands of cars.

You want spark plugs that you can install and then forget—not for a week or for a month, or six months, but for years. The Mezger Soot Proof Spark Plugs are guaranteed by us to give this result.

Go to your dealer and order a set. He either has them or will get them. If you want technical reasons why these plugs are all that we claim for them, then write to the factory.

Put them into competitive action with any other plug on the market. They will tell their own story of efficiency!

**C. A. MEZGER, Inc.**

15 CANAL PLACE

NEW YORK

## The Class Journal Company

**THE**  
**AUTOMOBILE**  
NEW YORK

PUBLISHERS  
239 WEST 39TH STREET  
**New York**

**MOTOR AGE**  
CHICAGO

SUBJECT:  
When 40,000 Motorists  
go shopping.

Mr. Car and Accessory Mfr.,  
Alive Street,  
Busytown,

Dear Sir:-

The great difficulty with most arguments is that one of the links that go to make up the chain is not admitted by the person to whom the argument is directed, and the whole chain, therefore, falls straightway to pieces.

Now, in the chain of argument - a summary of my preceding letters - I am about to present to you, I ask you to examine each link as carefully as you can, determine exactly how it fits together with the next link, and then to tell me frankly whether you think the chain I build for you is not as sound as steel itself and of as careful welding as ever made a chain.

Yours truly,

*Conde Nast*

*Read the two following pages →*



*Read the letter addressed to you  
on the preceding page*

---

Link 1.

40,000 intelligent men would not pay \$120,000 for a publication that hasn't a single word on a single subject except the proper use and economical maintenance of automobiles unless these 40,000 men themselves owned and used automobiles.

Link 2.

The average car owner drives at least 4,000 miles a year; therefore, the combined annual mileage of those 40,000 owners who subscribe to *The Automobile and Motor Age* is, at least 160,000,000 miles.

Link 3.

The driving of 160,000,000 miles a year means a perfectly gigantic expenditure for lost parts, worn gears, for oceans of oil and gasoline, for new tires, new equipment, new cars—an expenditure amounting to the colossal figure of \$54,303,000 a year.\*

Link 4.

These 40,000 car owners who subscribe to *The Automobile and Motor Age* must get suggestions *somewhere*; must seek information *somewhere* about the many and varied articles on which they spend so vast a sum of money.

Link 5.

Since they are already paying \$120,000 a year for *The Automobile and Motor Age* for the very purpose of getting information about the proper use and economical maintenance of motor cars, could there be, I ask you, any more natural place for them to go for their buying suggestions than to the pages of these very same publications?

Now then,  
unless you find some flaw in the welding of this chain,

*You will want to make known your business, your goods, in the pages of these very same publications. You will want your goods to be represented in the pages of The Automobile and Motor Age, as day by day, throughout the whole year 1913, these pages are searched for suggestions by 40,000 motorists, who, day by day, are spending that \$54,000,000 for just the sort of things you have for sale.*

\*My friend and associate, Mr. F. L. Wurzburg, General Manager of *The Automobile and Motor Age*, has made a careful estimate of what the 40,000 will probably buy. It is on the page opposite.

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# 54 Million Dollars

## In One Year for Cars and Maintenance

The average owner buys a new car every third year. We assume, therefore, that 13,333 car owners out of the 40,000 who subscribe to The Automobile and Motor Age are now in the market for new cars. And the whole 40,000 car owners will contribute their share to the millions which will be spent for equipment and up-keep during the year of 1913.

### These Millions are Itemized in the following Shopping List

		Quantity	Value			Quantity	Value
<b>COMPLETE CARS</b>				<b>ACCESSORIES (Continued)</b>			
Pleasure Cars.....	13,333		\$26,666,000.	Amount Carried Forward.....			\$46,060,000.
Insurance.....	30,000 policies		3,000,000.	* Self Starters.....	5,000		150,000.
<b>LUBRICATING &amp; FUEL</b>				* Shock Absorbers.....	10,000 sets		500,000.
Gasoline.....	20,000,000 gals.		4,000,000.	Bumpers.....	8,000		80,000.
Grease.....	800,000 lbs.		120,000.	Spark Plugs.....	480,000		480,000.
Kerosene.....	80,000 gals.		8,000.	* Speedometers.....	10,000		300,000.
Lubricating Oil.....	2,000,000 gals.		1,000,000.	Tool Kits.....	4,000		20,000.
Acetylene.....	100,000 recharges		200,000.	Trunks.....	5,000		75,000.
<b>TIRES, WHEELS &amp; RIMS</b>				Tire Trunks.....	5,000		50,000.
* Demountable Rims.....	2,000 sets		100,000.	Trunk Racks.....	5,000		10,000.
Inner Tubes.....	320,000		1,920,000.	Wearing Apparel.....	400,000 pieces		2,000,000.
Outer Casings.....	120,000		4,800,000.	* Wind Shields.....	10,000		200,000.
Tire Fillers.....	80,000 lbs.		40,000.	Waste.....	2,000,000 lbs.		300,000.
Tire Protectors.....	20,000		200,000.	Portable Garages.....	2,000		600,000.
Tire Covers.....	10,000		30,000.	<b>PARTS</b>			
Tire Repair Kits.....	20,000		80,000.	** Axles.....	1,000		50,000.
** Wheels.....	400		10,000.	** Bearings.....	40,000 sets		240,000.
<b>CARBURETION &amp; IGNITION</b>				Brake Lining.....	200,000 ft.		160,000.
* Batteries.....	960,000		240,000.	** Motors.....	400		100,000.
Ignition Cable.....	400,000 ft.		40,000.	* Elec. Lighting Systems	10,000		500,000.
* Carburetors.....	4,000		80,000.	** Radiators.....	1,000		35,000.
** Coils.....	1,000		20,000.	** Springs.....	10,000		100,000.
** Magnetos.....	2,000		100,000.	** Steering Gears.....	400		16,000.
Storage Batteries.....	10,000		150,000.	** Transmissions.....	100		17,000.
<b>ACCESSORIES</b>				** Valves.....	40,000		80,000.
Burners.....	80,000		20,000.	* Elec. Starting Systems	5,000		250,000.
Cleaning Supplies.....	200,000 gals.		200,000.	** Timing Gears.....	10,000		30,000.
* Clocks.....	10,000		80,000.	** Transmission Gears..	10,000		30,000.
* Elec. Warning Signals	15,000		300,000.	* Wood & Metal Boxes.	10,000		35,000.
Jacks.....	10,000		20,000.	<b>GARAGE EQUIPMENT</b>			
** Lamps.....	1,000		15,000.	Welding App.....	2,000		400,000.
Tungsten Bulbs.....	200,000		1,000,000.	Portable Hoists.....	2,000		200,000.
Misc. Accessories.....	400,000		1,000,000.	Storage Tanks.....	8,000		400,000.
Non-skid devices.....	40,000		280,000.	Tools.....	400,000		200,000.
Pumps.....	40,000		120,000.	Turntables.....	1,000		150,000.
Exhaust Horns.....	3,000		21,000.	Valve Grinders.....	5,000		15,000.
Road Books.....	80,000		200,000.	Vulcanizers.....	10,000		120,000.
			<u>\$46,060,000.</u>	Paints & Varnishes..	200,000 gals.		200,000.
				Enamels.....	75,000 gals.		150,000.
							<u>\$54,303,000.</u>

\* While these are supplied by the car manufacturer, their selection is largely determined by the demand created on the readers of these publications.

\*\* We have here taken into account only the replacements due to accident or wear. To these should be added the tremendous purchases made by the manufacturers themselves, who have their ear to the ground when they decide what magneto, what carburetor, what bearing, axles, lighting systems, etc., should be used on their cars.



# The Atwater Kent Ignition System

**T**HE Flexibility and Power obtainable from a motor equipped with the Atwater Kent Ignition System, especially our latest development, Model "K" with automatic spark control, is one of the most important developments in the motor industry.

Think what it means in smooth, sweet running that even the biggest and heaviest four and six-cylinder cars equipped with the Atwater Kent Ignition System may be throttled down on high gear through crowded streets as slowly as three miles per hour and accelerated on good stretches of road to the maximum speed of which the motor is capable without once touching the spark lever.

The automatic spark control of the Type "K" Atwater Kent System is more than human in its performance—it is sensitive to the slightest variation in speed—immediate in its response and positive in its action.

No single detail looking toward durability and simplicity has been neglected in this new type, which contains but three moving parts, virtually non-wearable, one contact and a single adjustment needed but once every 10,000 miles.

Picture the pleasure of automatic spark control on your present or future car and you will find your desires realized in the new Type "K" Atwater Kent Ignition System.

***Our booklet explains the Atwater Kent System and the value of automatic spark control. Write for a copy.***



## ATWATER KENT MFG. WORKS

4934 Stenton Avenue  
Philadelphia, Pa.

DISTRIBUTORS—New York, E. J. Edmond Co.; Chicago, Motor Car Supply Co., Pellets Magneto Exchange; San Francisco, Chanslor & Lyon Co., Weinstock-Nichols Co.; Los Angeles, E. A. Featherstone; Seattle, Chanslor & Lyon Co.; Portland, Ballou & Wright; Omaha, Omaha Rubber Co., Powell Auto Supply Co.; Dallas and Houston, Fisk Co. of Texas; Wichita, Hockaday Auto Supply Co.; St. Louis, Missouri Auto Specialty Co.; Salina, Lee Hardware Co.; Kansas City, Kansas City Auto Supply Co.; Milwaukee, Julius Andrae & Sons Co.; Detroit, Automobile Equipment Co.; Boston, Motor Supply Shop; Denver, Auto Equipment Co.; Hartford, Post & Lester Co.; Atlanta, Elyea-Austell Co.; Chattanooga, Southern Auto & Supply Co.

**JEFFERY-DEWITT CO. DETROIT, MICH. SPARK PLUGS**

**JEFFERY-DEWITT CO. DETROIT, MICH. SPARK PLUGS**

**Strengthen your customers' confidence in you by recommending Spark Plugs to them**

**JEFFERY-DEWITT CO. DETROIT, MICH.**

Prices shown around the circle: \$1.00, 75¢, 75¢, 75¢, \$1.00, \$1.25, \$1.25, \$1.25, \$1.25, \$2.00, \$1.50, \$1.00.

Every car owner that reads knows about J-D Spark Plugs. He either uses them himself or has talked with other owners who use them. Accordingly he knows of their efficiency. He knows that the Jeffery-Dewitt Company is the largest manufacturer of spark plugs in the world. He knows that their quality is of the highest—that the porcelain is baked by a secret process insuring the greatest security against cracking—he knows that every J-D Spark Plug is absolutely guaranteed.

Accordingly when you recommend to one of your customers J-D Spark Plugs you strengthen his confidence in your judgment. He becomes a better customer of yours.

If you don't know all about the J-D Spark Plugs and their method of manufacture and our satisfaction guarantee, better get posted, hadn't you? A line brings full information.

**51 Butler Avenue Jeffery-Dewitt Company Detroit, U. S. A.**

**"Your money back or a new plug, unless you are absolutely satisfied"**



# The Ward Leonard System

## *Electric Control Is Positive Control*

THE electric clock at the Naval Observatory in Washington is absolute monarch of all American time-keepers.

Every day in the year except Sunday, by a pendulum stroke, it speaks directly and instantaneously to every large town and city between the Atlantic Coast and the eastern slope of the Rockies. On the roofs of many city buildings a time ball drops, timed to the fraction of a second.

To do this requires sure action. It has been found by years of trials that electro-magnets are the only devices which give this sure action.

Likewise in the Ward Leonard Lighting and Starting System we find the dependable electro-magnetic principle employed to control the dynamo's output.

The Ward Leonard System is

noted for its uniformly splendid service week after week and month after month.

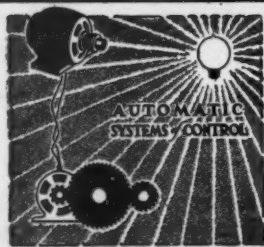
Perfectly controlled dynamo output means that the batteries are charged with the proper amount of current; that they are connected and disconnected at the proper instant and that this current is independent of the engine's speed.

The Ward Leonard System does away with all battery troubles. It makes the batteries "foolproof" because they require practically no attention

from the chauffeur. In fact the dynamo and whole system is readily understood by any driver because there are no mechanical governors, friction clutches, belts, ventilating fans, additional brushes or field windings.

Simplicity of control is the keynote of Ward Leonard construction.

**WARD LEONARD**



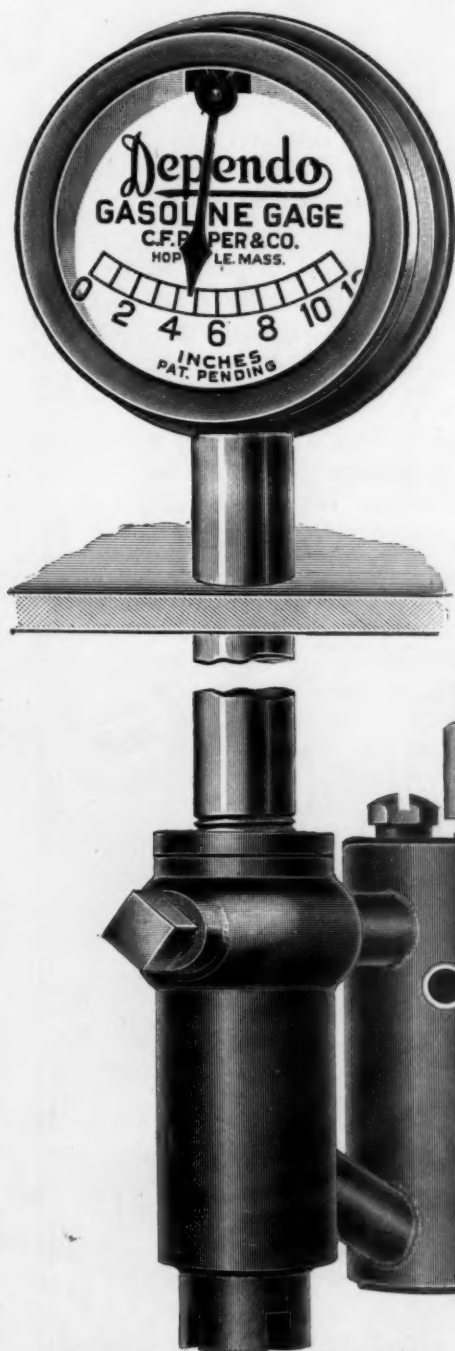
**Lighting - Starting**

**WARD LEONARD ELECTRIC CO.**

BRONXVILLE, N. Y., U. S. A.

# AT LAST!!

A Gasoline Gauge for Automobiles That Is Accurate and Dependable—Up Hill, Down Hill, On Side List and on the Hottest and Coldest Days, Shows at a Glance the Amount of Gasoline in the Tank.



## THE Dependo GASOLINE GAUGE

(ATTACHES TO THE DASH)

### \$7.50

BRASS OR NICKEL FINISH

#### Some of Its Many Advantages

No more Dry Tanks miles from garage.  
No more pulling up cushions to run measuring stick into tank.

Detects Leaky Tanks immediately.

Shows instantly amount of gasoline going into tank and amount being consumed per mile.

As dependable as your watch, and will not get out of order. Full directions for installing sent with each gauge.

SUPPLIED AT PRESENT FOR THE 1912-1913

**Ford, Overland, Buick, E. M. F.  
and the 1913 Studebaker**

*When Writing State Model*

If for other cars, send us name, model and year and we will notify you if we can supply you. Not made at present for cars having pressure tanks.

If your dealer cannot supply you, we will direct, on receipt of price.

Catalog No. 8 giving full particulars sent free.

#### A WORD TO DEALERS

The Dependo Gasoline Gauge is the first and only dependable one ever invented. Yet you know the demand for a gauge of the character of Dependo has been and IS insistent. Our campaign of national advertising which starts March 1, will surely augment that demand and show how Dependo will surely fill that demand to the letter.

You will have many calls for The Dependo. Why not stock Dependo at once and thus be able to fill orders promptly. Our proposition to dealers means dollars to you. Write us today for full particulars and catalog.

## C. F. ROPER & CO., Hopedale, Mass.



RB  
CO

## Hunting the Quarter Thousandth of an Inch No. 1 A Tale of Sixteen Traps



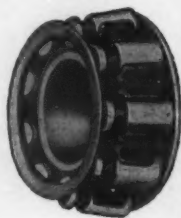
¶ Every tapered roller of the Timken Bearing runs the gauntlet of the sixteen traps!

¶ Trap No. 1 catches one size only. A roller one quarter of the thousandth part of an inch (.00025") smaller than that size can't spring trap No. 1. But trap No. 2 is sure to get it! Trap No. 3 finds the next smaller size; and so on, by quarters of thousandths of an inch to trap No. 16.

¶ The traps lie 'round the disc of a Timken-made machine that sorts the rollers into eighteen lots. First lot too large; last lot too small; sixteen in between. All the sixteen are

right, and each lot varies from the next by one fourth the thousandth of an inch. Each lot, too, goes into a separate canister which is sealed until used. So a workman who assembles the rollers on the cone *knows*, when he opens a canister, that every roller in it is the size of every other roller.

Timken  
Tapered



Roller  
Bearing

### Reason for the Traps

¶ Thus you can be certain that each one of the rollers in a Timken Bearing takes its share of the load—no more, no less. There is no 'high' roller to stand extra strain and get extra wear. There is no 'low' roller to loaf and throw its share of burden on the neighbors.

¶ There are roller gauging machines in the Timken Plant to sort out every size of roller used in every size of the Timken Bearing. Sixteen sizes to each machine. And the sorting is done automatically by the sixteen traps. Frail human judgment is eliminated.

### Gives an Added Value

¶ Time was when the gauging of Timken Rollers was left to human eyes and hands. Yet even in those days the unique Timken principle of tapered rollers revolving between a tapered cup and a tapered, two-ribbed cone gave a bearing that did what no other type of bearing could do.

¶ With the progress of the years such refinements in the making have added to the worth of right design an extra value in a still longer life of satisfactory service.

## The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company



# HERZ PLUG

The superiority of HERZ PLUG (Bougie Mercedes) is obvious. Aside from general excellence of workmanship, it has these definite advantages:

## Double-Stone Insulation

instead of Porcelain. It does not crack.

## Four Sparking Points

insure a fat, hot spark at any Magneto speed.

## Platinum-Alloy Electrode

will not burn away.

## Self-Cleaning

No clogging or corroding. HERZ PLUGS are guaranteed to give perfect service for a full year.

\$1.50 from any dealer

**HERZ & CO.**  
295 Lafayette St. New York.



## The Weak Point in Your Lighting and Starting System

### Have You Considered Its Importance?

The very life of an electric lighting or starting system lies in the storage battery. No matter how good the other parts of your equipment may be, without an efficient storage battery they are useless.

Does the battery you now use hold its charge?  
Does it deliver current at a high rate without injury?  
Does it receive a charge readily?  
Does it stand the abuse of rough driving?  
Does it match the quality of your car?  
Could you immerse your battery in its own solution without injury?



APLCO 6 Volt, 100 Amp. Hour Storage Battery

## APLCO Storage Batteries

are built with the highest grade plates obtainable, assembled in an all hard rubber, acid proof jar, sealed with acid proof cement, equipped with hard rubber binding posts, hard rubber knobs that cannot come off and acid proof rubber handles. Always clean and neat in appearance. Write for quotations today.

### THE APPLE ELECTRIC COMPANY

An Ohio Corporation—Capital Stock \$300,000, Fully Paid

15 North Canal Street

Dayton, Ohio, U. S. A.



Make Trucks  
Pay—Use

# Polarine

FRICTION REDUCING MOTOR OIL

Keep them busy, and properly LUBRICATED.

Polarine is made in ONE GRADE that lubricates every type of motor in every kind of car or truck.

It maintains the correct lubricating body at any motor speed or heat, and flows perfectly in zero weather.

It keeps every friction point protected with a durable slippery film. Millions of parts have run for years on Polarine practically without wear.

The World's Oil Specialists make it after 50 years' experience with every kind of lubricating problem and a study of all makes and types of cars.

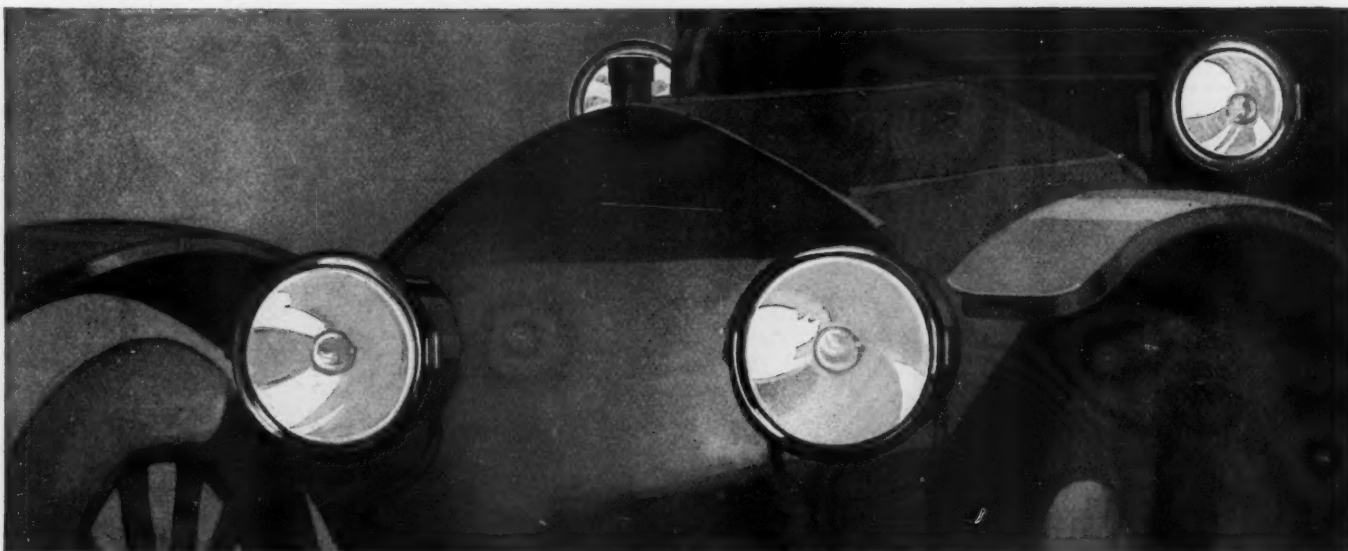
Polarine is worth to you many times its cost, because it stops the largest part of motor truck depreciation. Try it for three months and note the saving in repairs.

**STANDARD OIL COMPANY**

(AN INDIANA CORPORATION)

*Makers of Special Lubricating Oils for Leading Engineering  
and Industrial Works of the World*





# Westinghouse

## Electric

### Ignition, Lighting and Starting

**A**UTOMOBILE owners have no desire to have experiments tried on their cars. They want a starter that starts—always. Lighting and Ignition must also be absolutely dependable.

Manufacturers are expected to give buyers a car proven in every particular.

Four years were given to the perfecting of the **Westinghouse System of Ignition, Lighting and Starting**, before it was offered to the automobile trade.

The buyer can be sure that, when a car is

equipped with the **Westinghouse System of Ignition, Lighting and Starting**, there is nothing to worry about. It's automatic, and starts and lights at the press of a button.

The following statement has great weight with automobile buyers. "The Westinghouse Company backs its System of Ignition, Lighting and Starting with all its resources. It is in unequalled position to furnish service to manufacturers, agents and dealers who use its equipment, through its forty-five offices located in every large city in the country."



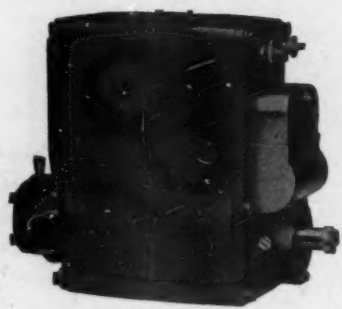
*Equip your cars with the Westinghouse System*



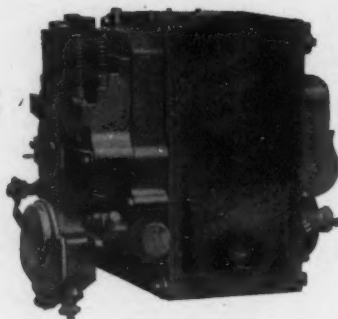
## Westinghouse Electric and Manufacturing Company

Sales Offices in 45 American Cities

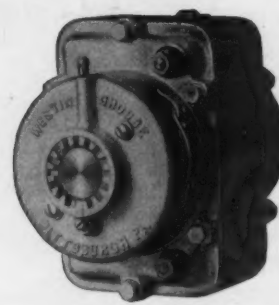
EAST PITTSBURGH, PA.



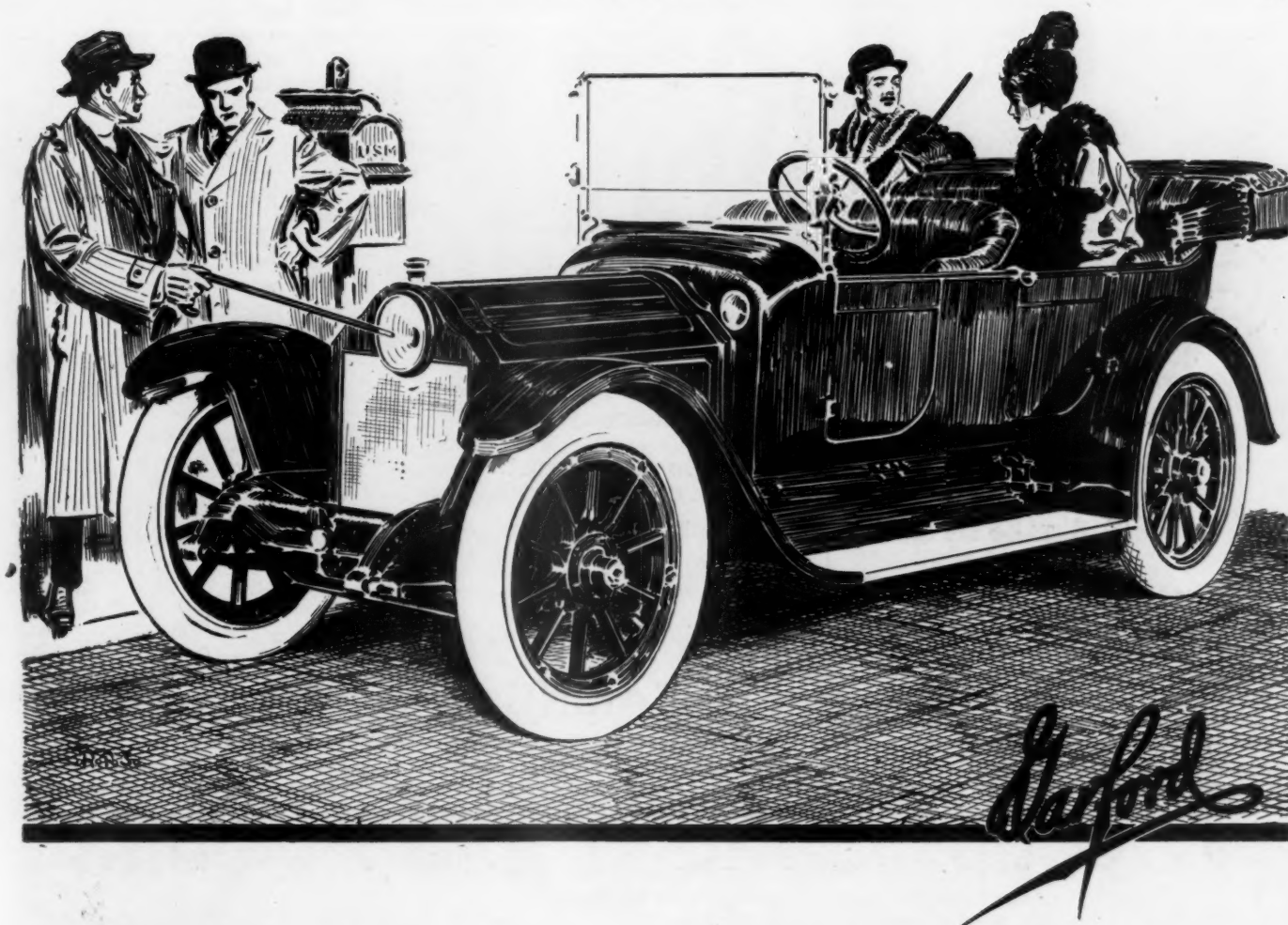
Lighting Generator



Combined Ignition and Lighting Generator



Starting Motor



## Public Approval of this New Six

We announced this new Six last month. On the day of its announcement we had telegraphic requests for information on deliveries from practically every important city in America.

It attracted more attention at the National Automobile Show than any other Six on exhibition.

The first car sold on the opening night of the Show was a new Garford Six. This sale took place just five minutes after the Garden had opened.

In seven days we had bona fide contracts for over fourteen hundred cars—which is more cars than most six cylinder producers make in a year.

There were more of the new Garford Sixes sold at the New York show than any other high grade Six represented there.

One of our dealers alone made twenty-six retail sales the first week this car was put on the market.

### \$2750—Completely Equipped

The new Garford Six is a five passenger touring car. It is electrically started, all lights are electric; the horn is electric; it has a sixty horsepower, long-stroke motor—the measurements of which are  $3\frac{3}{4}$  in. by 6 in.—the wheel base is 128 inches, the tires are 36 in. by  $4\frac{1}{2}$  in.; it has demountable rims; it has

the very practical and popular lefthand drive and center control. It is, of course, completely equipped with the very best and very finest accessories. The price complete is \$2750.

Full information from us or our nearest dealer.

*Catalogue on request. Please address Dept. 14.*

**The Garford Company, Elyria, Ohio**





Full Complement of Balls ;  
Solid one-piece separator ;  
Uninterrupted raceways ;

Full depth of raceways to resist thrust.

These are the four essentials in ball bearing construction, found only in Gurney Ball Bearings, which enable us to make the broad claim that no ball bearing on the market today has the capacity and endurance of the

## GURNEY BALL BEARING

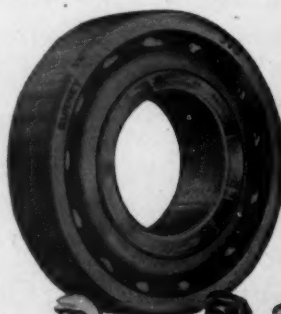
No ball bearing is better than its raceway. Gurney Ball Bearings excel because they are the only bearings possessing uniform raceways of the right contour.

No other ball bearing manufacturers can produce the perfect raceways that we produce, nor can they assemble, with as many balls, a complete bearing, with a single piece separator, as we do, without slotting the raceway.

Our right to claim the position of producers of the most efficient ball bearing on the market lies in the fact that the above statements are all true and proveably so.

Nothing will please us more than an opportunity to demonstrate the truth of these facts to your entire satisfaction.

Gurney Ball Bearing Co.  
Jamestown New York



When Writing to Advertisers, Please Mention Motor Age.



## Insures Light In Emergencies

### *Prest-O-Lite, the lamps, and the match*

These three simple elements give unequalled dependability, efficiency and economy to gas lighting.

Add the Prest-O-Lite, or any other good automatic lighter, and you have every feature of convenience the most complicated system can offer you. You may light or extinguish any or all your lamps from the driver's seat.

But remember this—should this convenience ever fail it does not leave you in the dark as the failure of any complicated system must. You can light your gas lamps with a match and you still have brilliant, dependable light.

The first rule of the manufacturer in the equipment of his car should be reliability. Any feature that sacrifices dependable lighting to convenience alone, detracts from the value of the car.

Prest-O-Lite's absolute reliability is unquestioned. There are no delicate adjustments, connections, or complicated attachments to get out of order. Prest-O-Lite is

so absolutely simple, it is trouble proof. If through carelessness, you allow your Prest-O-Lite to run dry, a Prest-O-Lite agency is close by, wherever you may be. Every city and town, and nearly cross-roads village, has its Prest-O-Lite exchange agency.

Prest-O-Lite gives all the light you need far ahead, and also concentrates light on the road directly ahead of the car, where you need it most. As a practical road light, Prest-O-Lite has no equal.

And with all its superiority, Prest-O-Lite costs less to operate and maintain than any other efficient lighting system.

No matter what self-starter you have on your car—insist on gas lighting. Almost any manufacturer will equip your new car with Prest-O-Lite and an automatic lighter if you insist. If your new car is now equipped with Prest-O-Lite, any dealer or any of our service stations can install an automatic lighter at small expense.

By all means, before you decide on any lighting system, send for the vital facts on automobile lighting. The coupon attached will bring you a free book on this subject by return mail. Send for it NOW and know the facts.

**The Prest-O-Lite Co.** 233 E. South Street,  
Indianapolis, Ind.

Canadian Factory and Branch Office, Merritton, Ont.

BRANCH STORES AND SERVICE STATIONS IN THESE CITIES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn., Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore., Providence, St. Louis, St. Paul, Minn., San Antonio, San Francisco, Seattle, Syracuse. In CANADA: Merritton, Ont., Toronto, Ont., Winnipeg, Man.

Exchange Agencies Everywhere

## Insist on Gas Lighting

THE PREST-O-LITE CO.,  
233 E. South St., Indianapolis, Ind.  
Please send me your Free Booklet,  
"Light on the Lighting Problem."

### To Automobile Owners and Dealers

Lighting convenience is a logical demand of complete automobile luxury, but at no time, and under no circumstances, should safety be sacrificed. The one—and only one—system that offers you perfect convenience, without sacrificing safety and reliability, is Prest-O-Lite in combination with a good automatic lighter.

Our literature explains in detail.  
Allow us to send it to you.

When Writing to Advertisers, Please Mention Motor Age.



**\$985**

F. O. B. Toledo

*Completely Equipped*

Self-Starter  
 30 Horsepower  
 5-Pass. Touring Car  
 110 inch Wheel Base  
 Timken Bearings  
 Center Control

**Overland****\$985**

F. O. B. Toledo

*Completely Equipped*

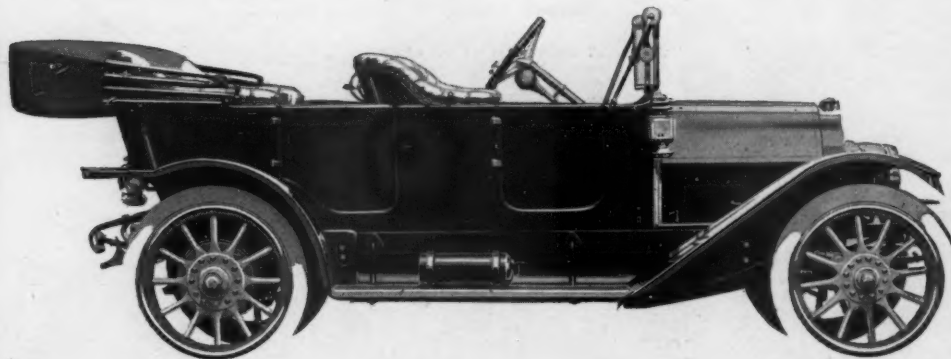
Remy Magneto  
 Warner Speedometer  
 Mohair Top and Boot  
 Clear Vision, Rain Vision  
 Wind Shield  
 Prest-O-Lite Tank

**D**EALERS contracted for 39,000 Overland cars before our first 1913 announcement was made. They knew the Overland would be the most conspicuous 1913 car. Any article which continues to beat, baffle and dominate all similar products year after year must be the acknowledged leader.

Study the value above and you'll understand why we do lead.

Catalogue on request. Please address Dept. 46.

**The Willys-Overland Co., Toledo, O.**



*When Writing to Advertisers, Please Mention Motor Age.*



# New Departure Ball Bearings

American-made for American Trade

A review of the 1913 models of American built pleasure cars exhibited at New York and Chicago demonstrates a marked increase in the use of ball bearings in preference to those of other types.

If it is desirable to mount rotating parts upon a journal possessing less friction and requiring less work to drive than does the plain bearing, it is only reasonable to use that type of journal possessing the least friction, requiring the least power to drive, and, therefore, the most efficient.

The ball bearing is ten times as efficient as a roller bear-

ing under same load conditions, and thirty to fifty times as efficient as a plain bearing.

The American made New Departure is the quality bearing of the world. This bearing is to be found in 80 per cent of the cars manufactured for 1913 selling.

See the New Departure demonstrated at the Boston Show, Space Number 430, Balcony, March 8th to the 15th.

A pamphlet discussing the relative success of all types of bearings in eliminating friction is now on the press.

Send for your copy today.

**AMERICAN**

**GENIUS**

**ALWAYS**

**WINS**

**The New Departure Mfg. Co.**  
**Bristol, Conn.**

Western Branch: 1016-17 Ford Bldg., Detroit





PLANT No. 1, BERLIN, GERMANY.

**BALL ~ BEARINGS**

HB DWF

**The Hess-Bright Manufacturing Company**  
*Pioneers in the introduction of Annular Ball Bearings*

Most extensive resources and plants in existence devoted exclusively to ball bearing manufacture. Enlarging and improving facilities, product and capacity for distribution.

Main Offices and Plant No. 2 on line of Penna. R. R. to New York  
 9 E. Erie Ave., Philadelphia, Pa.

Stores for Retail Distribution:  
**PHILADELPHIA** 666 North Broad Street  
**NEW YORK** 1974 Broadway  
**CHICAGO** 1800 Michigan Avenue

CATALOGUE UPON REQUEST



PLANT No. 2, PHILADELPHIA PENNA.





# INTERLOCKS

## Stop Your Tire Trouble

Don't fail to write today for Interlock Booklet which tells all about Interlock Inner Tires, and gives many new tire pointers of the greatest value to every automobile owner.

The Interlock is an **extra inside tire** which is placed between the outer casing and the inner tube for the purpose of so strengthening the tire that it will be proof against blow-outs, rim cuts and punctures and therefore last twice as long.

When you know what Interlocks will do, you will want them. They give you practically **two tires on each wheel** with no change in the looks of the tire. With this combined strength you can run your car an entire season without delays, annoyance or tire trouble, and save about half your tire expense.

In writing for catalog, please give name of your local dealer, and if he cannot supply you with Interlocks, we will send you the name of a nearby dealer who can.

**To Dealers:** A good proof of the efficiency of Interlocks is that they are regularly stocked in all sizes by the largest jobbers who only handle quality goods, such as Beckley-Ralston Co., Chicago; Bi-Motor Equipment Co., and Iver Johnson, Boston; Fry & McGill Co., Denver; Motor & Machinist Co., Kansas City; Chanslor & Lyons, Los Angeles; Western Auto Specialty Co., Iowa City; Ia.; Gibson Automobile Co., Indianapolis and all leading automobile supply houses.

## We Want Live Dealers Everywhere

Write for our proposition and give the name of your jobber.

**DOUBLE FABRIC TIRE CO.**  
 128 9th Street Auburn, Ind.

When Writing to Advertisers, Please Mention Motor Age.

# GABRIEL REBOUND SNUBBER

**EASY TO ATTACH—IMPOSSIBLE TO MATCH**

GABRIEL SNUBBERS have established themselves as the most practical and efficient shock preventing device ever produced.

They are a modern device designed to meet the requirements of the high set, flexible type of spring now in universal use.

They stop bouncing and jolting caused by rough roads without spoiling the flexibility of the springs on smooth roads.

Automobile engineers were quick to discover the merits of the Snubber and a number of them have adopted it as standard equipment on leading cars. No noise or adjustment.

SEND FOR CATALOGUE AND AGENCY PROPOSITION

**GABRIEL HORN MFG. CO.**  
1415 East 40th Street Cleveland, Ohio



**TRANSMISSIONS**

**CLUTCHES**

**STEERING GEARS**

"The Value of Our Product Is Not in Its Price—But in the Service Rendered"

**"OF QUALITY"**

**WARNER GEAR CO., Muncie, Ind.**

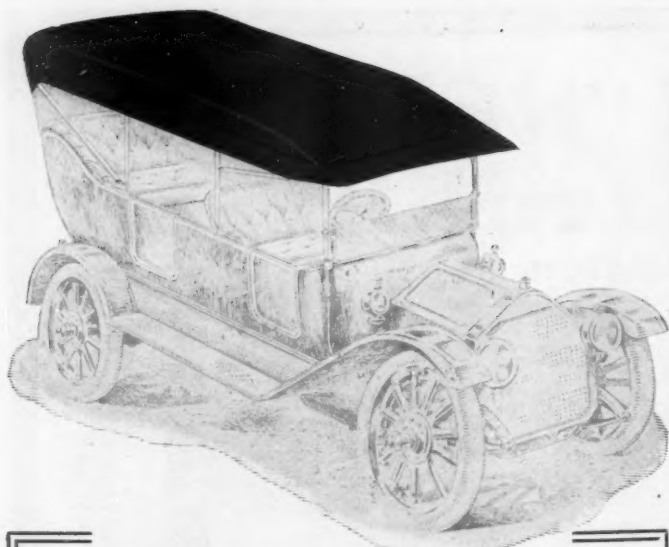
DETROIT OFFICE—628 FORD BLDG.

**DIFFERENTIALS**

**CONTROL LEVERS**

*When Writing to Advertisers, Please Mention Motor Age.*





## A New Auto Top For \$5

Think of it! An absolutely waterproof, clean, black top to keep up that most desirable neat appearance of your car—all for a single five dollar bill.

This means a definite saving of \$30 to \$60, the price of a new top; it means **renewing** the classy appearance of your car—at an amazingly low cost compared to what you expected to pay. It's worth while going into this matter!

**RUB-R-TITE Auto Top Waterproofing** transforms a "rusty" looking and leaking top into practically a new one. Doesn't matter if it's a Mohair, Pantasote or Rubber Top—RUB-R-TITE waterproofs it with a flexible, durable coating that will neither crack, peel, rot or spot. An occasional coating of RUB-R-TITE thinned will preserve the looks and wearing qualities of a new top indefinitely. Easily applied with a brush by your chauffeur, garage or repair man or **yourself**—experience not necessary.

To renew the spotted inside lining of the top, just use our Rub-On Concentrated Lining Dye. The color can't wash out—then with RUB-R-TITE and our Dye you can have a new top inside and outside.

### Every Can Guaranteed to Satisfy

Better write today for full information and samples of RUB-R-TITE applied to a top like yours—remember the new appearance it gives; how absolutely waterproof it makes it, and the low cost of the improvement. Use the coupon to hurry the information.



**RUB-ON MANUFACTURING CO.,**  
357 Elm St., Buffalo, N. Y.

#### Our Other Standard Auto Aids

Rub-On Elastic Varnish for refinishing faded bodies. Stay-On Enamel for Lamps, Hoods, Fenders, Engines, etc.

Sta-Fix Radiator Mend stops leaks without tools or solder.

Col-R-Of Leather Dyes for Upholstery, cushions, back, etc.

Freezenot Radiator Liquid for winter use—cold test 54 degrees below.

Auto Turn Jack—lifts, turns a car in 1 minute.

### Dealers!

Write for trade prices and discounts. Take advantage of our advertising and make sales of Rub-On Products.

Name .....  
St. and No. ....  
City and State.....  
My top is.....  
Dealer's Name .....

Rub-On  
Mfg. Co.  
Buffalo, N. Y.

Please send me without cost, full information as to your Auto-Aids and samples of work.

## CAR MANUFACTURERS USE THIS CRANE

Some of the foremost motor car manufacturers of the United States are using **PORTABLE STEEL GARAGE CRANES** in their assembly rooms. These cranes are cutting dollars off department cost. They are enabling one man to do work that heretofore required two. They are putting 20 hours into every 10 hour working day by doubling every workman's capacity.

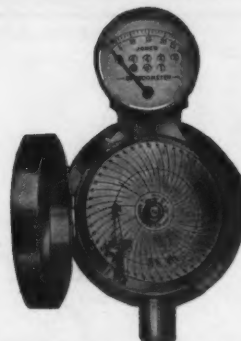
### The Portable Steel Garage Crane



Is absolutely safe. It is securely double-locked. It is a mechanical impossibility for a load to "slip." All structural parts are made of steel. It is on roller bearing wheels; a boy can roll a crane to a car quicker than 4 men can shove a car to the crane. It does away with floor-pits and crawling under a car. With it you can in 2 minutes' time suspend the heaviest car made. You can take out a motor or lift a body at a minimum expenditure of time and muscle.

Built in  
Three Sizes  
WRITE FOR  
PRICES

**LAFAYETTE  
ENGINEERING CO.**  
LaFayette, Indiana



## Are Your Trucks Efficient?

**YOU** can only determine by record of performance. Human records are not reliable—

### The Jones Recorder

furnishes reliable performance records. The record is in the form of a graphic chart—easily interpreted and easily understood. The lines on the chart tell the story of speed, of starts, of stops, of distances, of loading and unloading intervals.

It is the means for the elimination of waste in the delivery organization.

Write for further information.

### The Jones Speedometer

Broadway at 76th Street, New York  
Plants, Bush Terminal, Brooklyn, N. Y., New Rochelle, N. Y.

## Watch the Wiring on Your Car

You know what it means to get stalled many miles from home—you tear your car apart—the magneto, the spark plugs, the dynamo and battery are found in good condition. In the majority of cases you trace your troubles to defective cable or poor wiring. Don't take any chances on poor wiring—see that your car is wired with

**Packard**  
**CABLE**

### Saves Rewiring of Cars

When you buy a new car, demand Packard Cable. Don't be satisfied with inferior wire that will later cause trouble and expense.

Packard Cable requires about three weeks to produce, inspect and test. That's why it costs more at the start, but less in the end. See that your car is wired with the dark brown cable with red stripes so you won't have to have it rewired again at additional cost to you.

**The Packard Electric Company**

Dept. C

Warren, Ohio

## Prime Your Motor

If you have "ALL-IN-ONE" Spark Plugs you can quickly prime your motor and easily start it on the very coldest morning. Easy priming is only one of the advantages given by the "ALL-IN-ONE" Petcock. Open the petcock while the motor is running and all soot will be blown off the sparking points—a true **self-cleaning plug**. Open the petcocks when the motor is missing and you'll quickly detect which cylinder is giving trouble—a **real trouble finder**.



Open the petcock and inject a little kerosene—this is the **best carbon remover** ever tried. "ALL-IN-ONE" has the best feature of other plugs—and the Petcock besides.

Price, \$1.25 Each

We shall prosecute vigorously all infringements now on the market or any which may spring up in the future

**FRONTIER SPECIALTY CO.**  
BUFFALO, N. Y.



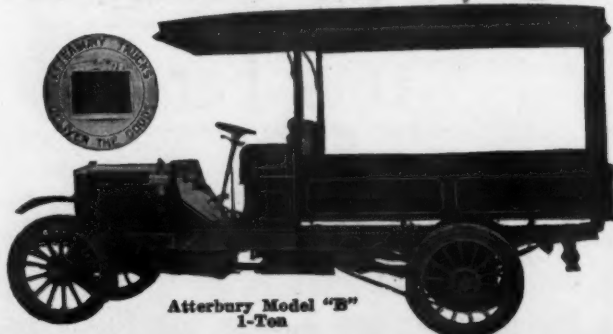
# ATTERBURY TRUCKS

## Deliver the Goods

THE merchant who is competing most successfully with his business rivals is the merchant who delivers the best goods in the shortest space of time. Modern business demands quick and efficient delivery service. Both these qualities are embodied in the ATTERBURY TRUCK, the standard of commercial car perfection. Our famous one, two and three ton trucks are the marvels of the age.

Send for our booklet on  
"How to Deliver the Goods"

Atterbury Motor Car Co., 781 Hertel Ave., Buffalo, N. Y.  
GASOLINE AND ELECTRIC CARS, MOTOR  
TRUCKS, HOTEL OMNIBUSES, ETC.



Atterbury Model "B"  
1-Ton

## The Spark Plug Pump

\$10.00

A SIMPLE and powerful pump adaptable for use on all cars from the smallest Ford to the largest Lozier. Instantly attached by substituting for a spark plug. Pumps nothing but pure, fresh air. Inflates the tire in from 2 to 4 minutes. Built with metal rings like your engine, and will last as long. Requires no attention other than an occasional drop of oil. Weighs only 2½ pounds. Furnished with adapters to fit any car, 12 feet of hose, and connections. With Pressure Gauge—\$2 extra.



YOU CAN TRY IT ON YOUR  
OWN MOTOR BEFORE PUR-  
CHASING.

The Mayo Mfg. Co.  
55 E. Eighteenth St., Chicago



## Veeder

### The Only Way

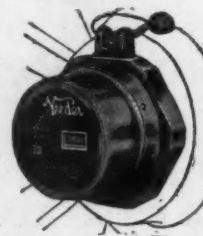
to know how much gasoline or "juice" you are using per mile is to have an exact mileage recorder like the VEEDER HUB ODOMETER.

Neat, durable and compact, it can be easily attached. Price complete. **\$25.00**

At your dealers', direct from our factory or at the following agencies:

T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

Bernard I. Bill, 543 Golden Gate Avenue, San Francisco, Cal.



### The Veeder Manufacturing Company

C. H. VEEDER, President D. J. POST, Treasurer  
H. W. LESTER, Secretary  
HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings.



TYPE A. B. AMMETER  
(Made also with center zero)

No Lighting Engineer would consider an electric lighting installation complete unless suitable meters were included.

Is your Auto Lighting Plant complete?

## HOYT METERS

Have Proved Their Worth in Automobile Lighting

ASK FOR BULLETIN 7

Hoyt Electrical Instrument Works  
Penacook, N. H.

**Why The K-W Master Vibrator for Ford Cars?**

**BECAUSE IT POSITIVELY GIVES**

**A HOTTER SPARK  
A SMOOTHER RUNNING ENGINE  
EASIER STARTING**

**OVER 36,000 FORD OWNERS HAVE INSTALLED THEM**

and more are doing so every day. Watch the number grow monthly. Our Guarantee: Try the K-W Master Vibrator for 30 days and if you can get along without it return it and we will send you your money back and ask no questions. Send for folder.

**BE SURE TO GET** **K-W** **AND HAVE THAT SATISFIED FEELING**

We make a complete line of ignition apparatus. Don't simply ask for Catalogue—Tell us your troubles and we will help you.

**Price, \$15.00**

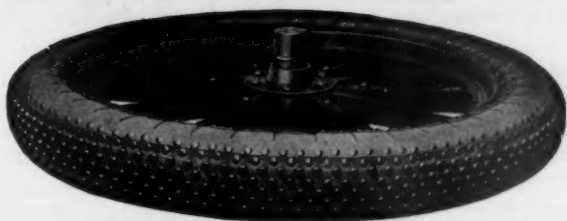
**Write for Complete Catalog**

**WE PAY THE EXPRESS**  
East of the Mississippi River.

**AGENTS IN ALL PRINCIPAL CITIES**

**THE K-W IGNITION CO.**  
2835 Chester Avenue  
CLEVELAND, OHIO, U.S.A.

**NEW YORK.....E. J. Edmond, 1783 Broadway** **BOSTON.....Walter J. Forbes, 243 Columbus Ave.**



## Guaranteed 5,000 Miles Without Puncture

With Durable Treads we give a written guarantee for 5000 miles without puncture. This is binding whether your tires are new or old, tread-worn, rim-cut or rut-worn. They are the only protectors built to do so.

Durable Treads reduce the cost of your tire up-keep 50%. They save delays and troubles. They absolutely prevent skidding, without injuring your tires.

*Durable Treads*

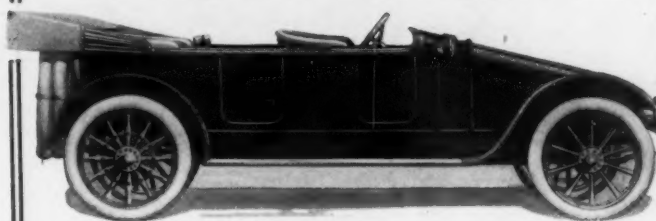
cost half the price of tires. They make your tires wear three seasons instead of one. We let you test Durable Treads at our expense—you send no money—promise nothing. Write us at once for details of test plan, special discount, sample, etc. Learn how Durable Treads save you \$50 to \$200 each season.

**COLORADO TIRE & LEATHER CO.**  
1128-A Karpen Bldg., Chicago, Ill.  
1848-A Acoma St., Denver, Colo. 524-A W. 34th St., New York  
435-A Golden Gate Ave., San Francisco, Calif.

**THEY PREVENT SKIDDING**

## Croxton "Six"

The Season's Great \$3000 Car



Here is a car which shows such an important advance in automobile design and construction that every buyer and every dealer should be sure to see it.

The Croxton has all the features that make any car desirable, and it has many which you can't find in any other.

The man who runs the Croxton has a car that embodies engineering skill of the highest order, as well as the utmost elegance in line.

The Croxton is made in a full line of models, "Fours" and "Sixes."

Write or wire today for full details and specifications.  
Ask for Booklet A-3.

**The Croxton Motor Car Company**  
Washington, Pennsylvania



\$10.00

\$10.00

\$10.00

**THE REACTO**

Will clear the way on the busiest thoroughfares. The tone is loud and penetrating—not abruptly harsh. A strictly high grade vibrating horn—delivering the blow to the diaphragm on the reacting stroke

The Holtzer-Cabot Electric Company, Chicago, Ill.—Brookline, Mass. Send for Booklet 150M



## JUST AS GOOD AS SE-MENT-OL

**CARBONOX**

**THERMITE**

**BRASSKOTE**

**TIRE-LAC**

**NEVER-BURN**

**NEVER-RUST**

**PIONEER BRAND**



Chemically correct carbon remover. Loosens the carbon after which it is blown out through the exhaust.

Prevents freezing of water in radiator at 70 degrees below zero - used effectively diluted one-half.

Air drying brass enamel.

Chemically correct tire paint.

Perfect engine and boiler enamel.

Strictly all right rim paint.

Top Dressing  
Valve grinding Compound  
Auto body Polish.

The NORTHWESTERN CHEMICAL CO.  
MARIETTA, OHIO.



Neither  
Rain, Mud  
Nor Dust  
Can Harm

your luggage when it is  
carried in the new rain-proof, water-proof

## Kamlee Auto Trunk

"Made by Trunk Makers Who Are Motorists"

Embodies every desirable feature—strength, lightness, durability, beauty. It adds to rather than detracts from the appearance of any car.

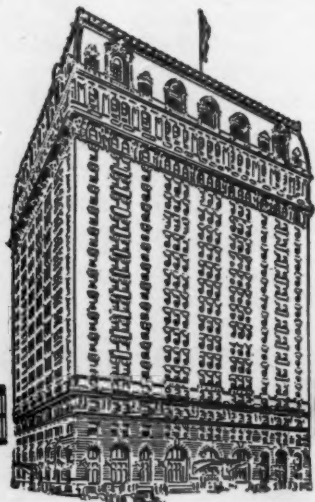
Consider these exclusive Kamlee features before you buy an auto trunk, then you'll surely select a Kamlee: patent drop front—no lifting of lid—patent inter-locking edge makes it air-tight, dust-proof, rain-proof; no straps to bother with in opening; fitted with standard suit-cases permitting removal of one party's luggage without disturbing others.

Ask Your Dealer or write us for price and descriptive circular. If your dealer can't supply you, we'll gladly ship you a Kamlee on approval.

THE KAMLEE CO.

234 Broadway, Milwaukee, Wis.

Look for the Red and  
Gold Diamond  
Inlaid Right on  
Front Cover



## Hotel La Salle

CHICAGO'S FINEST HOTEL

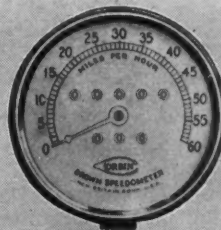
ERNEST J. STEVENS, Vice-Pres. and Mgr.

Located in the heart of the city, within easy reach of all railway terminals

### RATES

ONE PERSON	Room with detached bath...	\$2 to \$3 per day
	Room with private bath...	\$3 to \$5 per day
TWO PERSONS	Room with detached bath...	\$3 to \$5 per day
	Room with private bath...	\$5 to \$8 per day
TWO CONNECTING ROOMS WITH BATH		
Two persons		\$5 to \$8 per day
Four persons		\$8 to \$15 per day
SUITES		\$10 to \$35 per day

LA SALLE AT MADISON STREET, CH. CAGO



"Built with  
the Precision of a  
Watch"

## CORBIN-BROWN SPEEDOMETER

"The Speedometer of Absolute Accuracy"

NOTE these features:

Extreme mechanical simplicity.

Highly sensitive centrifugal governor which responds to the slightest change in speed.

The peculiar construction of the flexible shafting which greatly decreases frictional wear and insures smooth running.

Perfect adaptability to the recording of the lowest as well as the highest rate of speed.

Ability to record 100,000 miles instead of the usual 10,000 miles, affording a complete record of mileage covered.

Write for Catalog.

The American Hardware Corporation  
Corbin Screw Division

209 HIGH ST., NEW BRITAIN, CONN.

Branches: New York, Chicago, Philadelphia

Makers of the famous Corbin Coaster Brakes  
for motorcycles and bicycles

**ABSOLUTELY NEW.**

PRONOUNCED BY EXPERTS TO BE THE GREATEST INNOVATION IN AUTOMOBILE TIRES OR TUBES OF ANY OF THE INVENTIONS IN YEARS.

It is built exactly as cut represents.

You will readily observe how such a tube will reduce the liability of puncture.

**ELIMINATES PINCHING.**

Lessens liability of blowouts; requires less air pressure—therefore, more life to casings, as well as easier riding.

Highest grade rubber.

Sixteen years' experience in its workmanship.

Moulded in the shape in which it is used.

No stretch in the tread.

Almost self-healing.

We have thoroughly tested it in every way and now are pleased to offer it to the public as being an article that will fill a long felt want.

We solicit your inquiries.

*Manufactured Exclusively By*

**KOKOMO RUBBER COMPANY**  
Dept. D KOKOMO, IND., U. S. A.

**WHY NOT  
HAVE  
ON YOUR  
CAR?**

**THE WELLS GENERATOR**

*is cheaper than gas—is more reliable*

It consumes nothing but the waste energy of your engine and out-lasts the car.

It always produces correct amount of current at all speeds and protects battery by means of special *Magnetic Shunt*. Easily installed. **WRITE FOR BOOK.**

**R. C. WELLS MFG. CO.,** Wells Building, Fond du Lac, Wis.

# Motor Age

CONTAINS WEEKLY

—THE—

BEST BUDGET OF  
AUTOMOBILE NEWS  
IN THE WORLD

## Remy Magnetos

### 400 Sold Daily

This is not the record of a single day. This is a daily average—for four months ending with January—of cars newly equipped with Remy magnetos. These figures have never been approached by any other manufacturer.

**Inductor type—Simplest, Strongest  
Built for 24-Hours-a-Day Service**

## Remy Electric Co.

World's Largest Ignition Factory  
ANDERSON, INDIANA

## WHY A BOWSER SAVES

Gasolene is too high priced to waste and it's bound to be wasted in the ordinary "air-tight" tin faucet above ground containers.

If you want to keep gasolene in the same high grade condition that you buy it, install it in a Bowser Underground tank where the temperature hardly varies the whole year round.

### A Bowser System is Easy to Operate

There is no spillage, no waste, no lugging of pails full of gasolene from the tank outside the garage in rainy or sleety weather, no evaporation, no loss of any kind. It's the simplest, quickest, cleanest, most economical method you ever imagined.

You can buy a Bowser Underground Storage Outfit to meet your needs and fit your purse. It will save enough to pay for itself this year and will outlast a lifetime.

*Send for free illustrated booklet*

**S. F. BOWSER & CO., Inc.,** Home Plant and General Offices  
Box 2126, FORT WAYNE, IND.

**BRANCHES**

Atlanta  
Minneapolis  
St. Louis  
Albany

Chicago  
New York  
San Francisco  
Harrisburg

Dallas

Denver  
Toronto

Patentees and manufacturers of standard, self-measuring, hand and power driven pumps, large and small tanks, gasolene and oil storage and distributing systems, self-registering pipe line measures, oil filtration and circulating systems, dry cleaner's systems, etc.

Established 1885.

*Deliver gasolene  
from here to your  
car without con-  
tact with the air.*

When Writing to Advertisers, Please Mention Motor Age.



The 6-Cylinder, Reasonably Priced

# de Soto

55 H.P.

The car with a stronger appeal than any recent product of the trade—the one that meets a popular demand. We have an unusually attractive proposition for dealers. Write at once for free catalog and full particulars.

Sells for  
**\$2,185**



de Soto Motor Car Company, Auburn, Ind.

## Dreadnought Moline M-40

**\$1950**

Completely Equipped  
Electric  
Self-Starter  
Electric Lights



Five Passenger Touring Car. Full 40 H. P. Moline Long Stroke Motor. Unit Power Plant three point suspension—124-inch wheel base, top, windshield, speedometer. Send for printed matter.

**MOLINE AUTOMOBILE COMPANY**  
40 Keokuk Street East Moline, Ill.



# Red Head

REG. U.S. PAT. OFFICE

MAGNETO PLUG



All Sizes  
All Styles  
Porcelain  
or Mica **\$1.00**

**EMIL GROSSMAN COMPANY**  
Manufacturer  
250 WEST 54th ST.  
NEW YORK  
Detroit Branch and Factory  
844 Woodward Avenue

# SHELDON

AXLES & SPRINGS  
ARE  
INVINCIBLE

**THE SHELDON AXLE CO.**  
WILKES-BARRE, PA.

CHICAGO OFFICE: 68 East 12th Street.  
DETROIT OFFICE: 1215 Woodward Ave.

## Blood Bros. Universal Joints

Style A will run 50,000 miles with one filling of the grease caps

**Blood Bros. Machine Co., Kalamazoo, Michigan**

## Increase Your 1913 Accessory Sales



You can easily do it if you will investigate the profits for you in the Essex Line of Auto Accessories. The Essex Trademark is your guarantee of a bigger, better and far more profitable Accessory business. Representative dealers everywhere know that Essex Quality Counts. Prove it for yourself—write for the 1913 Essex Catalog now.

**ESSEX RUBBER COMPANY**  
Principal Offices and Factory, TRENTON, N. J.

# KEETON

DETROIT U.S.A.

"SIX-48"  
**\$2750**  
Fully Equipped



Write for Booklet  
*Riverside Touring Car*

**Keeton Motors Ltd.** Brantford Ont. Canada.  
**Keeton Motor Co.** Lawton 8 M.C.R.R. PHONE WAL 1067 Detroit U.S.A.

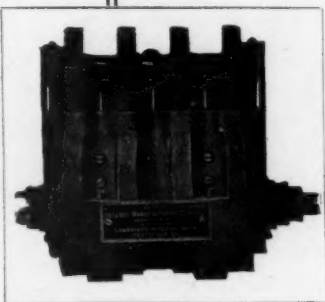
## BLACK EAGLE SPARK PLUG

**50¢**



**The STANDARD COMPANY** Torrington, Conn.

Inflating the largest tires to any desired pressure in the shortest space of time, the



Four Cylinder  
**KELLOGG**  
Air Pump

relieves you of all unnecessary labor.

We have attachments in stock for the CADILLAC, 1911-'12-'13 and all Cadillac agents are requested to write us for special proposition.

### KELLOGG MFG. COMPANY

33 Circle St., Rochester, N. Y.

CHICAGO.....1108 Michigan Ave.  
NEW YORK.....1733 Broadway  
SAN FRANCISCO.....444 Market Street



## Johnson Trucks

1-Ton  
2-Ton — Chasses  
4-Ton

Write for Specifications

JOHNSON SERVICE CO., Milwaukee

## J-M DRY BATTERIES Fully Guaranteed

This Guarantee applies to each and every Battery we put out:

"If J-M Dry Batteries do not prove satisfactory, the customer shall be allowed credit for same, new batteries, or money back, including transportation charges."

Dealers and users are protected by the guarantee. Shipment made same day order is received. Your dealer will supply you, or we'll ship direct from our nearest branch. Send trial order and ask for booklet on Economical Battery Connecting.

### H. W. Johns - Manville Co.

Albany	Detroit	New York
Baltimore	Indianapolis	Omaha
Boston	Kansas City	Philadelphia
Buffalo	Los Angeles	Pittsburgh
Chicago	Louisville	San Francisco
Cincinnati	Milwaukee	Seattle
Cleveland	Minneapolis	St. Louis
Dallas	New Orleans	Syracuse

For Canada:—THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto Montreal Winnipeg Vancouver 1798



SIMPLE

EFFICIENT



COMPACT

Indestructible

## THE "INTENSIFIRE"

Is just what the name implies.  
Makes your Magneto Spark Hotter.  
Gives Increased Power and Speed.  
Makes Cranking Easier.  
Minimizes Gear Changing.

### And at the same time

Decreases the heat at Point of Contact.  
Doubles the Life of Platinum Points.  
Cannot possibly injure any ignition system.  
Can be used with Any Magneto.

**Price \$5.00**

AND YOU CAN ATTACH IT YOURSELF

MANUFACTURED BY

Electrical Specialties Manufacturing Co., Omaha, Nebraska

FOR SALE BY

**THE OVERLAND SALES CO.**

1140 Michigan Avenue, Chicago



## Get Posted on Lights

Don't buy new lights for your car until you learn all about

*Guide*

## Electric Headlights

Tell us to send you Guide Book No. 6. It puts you wise to what is best in lamps.

The Guide Motor Lamp Manufacturing Company  
East Fourth Street Cleveland, Ohio

# McFARLAN

## SIX

Electric Lighted Self Starting

SERIES "S"—45 H. P., 2, 4 and 5 Pass.—\$2,300  
SERIES "T"—50 H. P., 2, 4 and 5 Pass.—\$2,500  
SERIES "M"—60 H. P., 2, 4, 5 and 7 Pass.—\$2,750

New Six Passenger, Coupe and Limousine  
Bodies slightly higher

TERRITORY OPEN FOR PROGRESSIVE DEALERS

Pioneer Six-Cylinder Car Builders of America

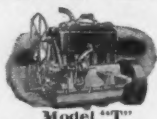
McFARLAN MOTOR CAR CO., Connerville, Ind.

## SALESMANSHIP IS A NECESSARY EVIL

The less the buyer wants your goods, the more you've got to use of that costly stuff. The way out is—sell what the Buyer wants. In the motor field that is the



We're 25 years old now and you can rest assured there will never be any "out of business" sign up when you want that interchangeable part.



Special arrangement for "get-at-ability"; also a Special Oiling device—best yet.

All the details to you if you write to

**BRANDENBURG & CO.**

1108 S. MICHIGAN AVE.  
CHICAGO.

57TH AND BROADWAY  
NEW YORK CITY.

FORD BUILDING  
DETROIT.

## GET Acquainted WITH EAGLEINE NO-KARBON OIL

EAGLEINE NO-KARBON OIL possesses less than one-half the carbon and other impurities contained in all other cylinder oils. It's a lubricating wonder. Its use means a clean motor.

**EAGLE OIL & SUPPLY CO.**  
104 BROAD ST., BOSTON.  
114 W 37th ST., CHICAGO, ILL.



# Oakland

The Car with a Conscience

**OAKLAND MOTOR CAR CO.**  
PONTIAC MICHIGAN

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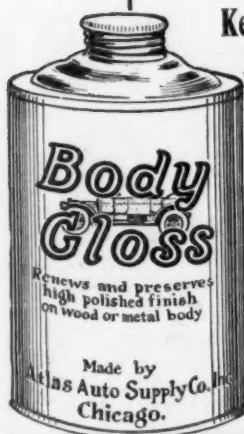
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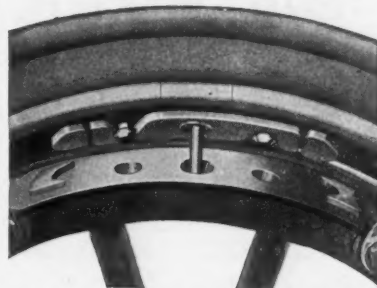
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### Easy of Operation

Only four nuts to loosen and tighten in making a change with this rim.

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is exceedingly easy-riding and comfortable. The straight line low slung body, deep upholstery and luxurious appointments of the Sturdy STUTZ give it that aristocratic design which lends dignity and quality to a high class motor car.

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\$3500 in Cash Prizes

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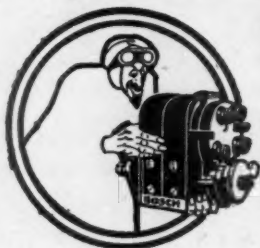
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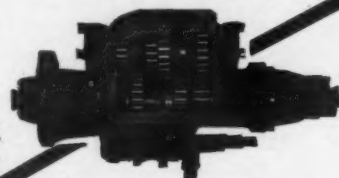
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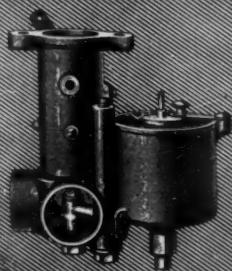
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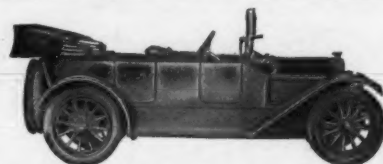
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**ANNULAR BALL BEARINGS**  
The Dependable-Kind

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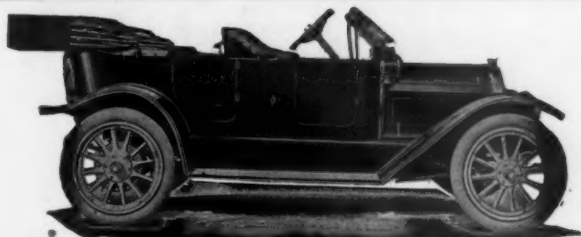
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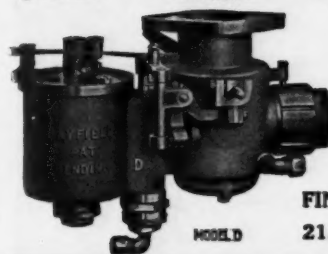
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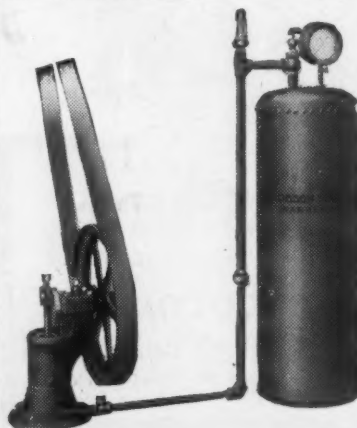
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6 Cylinder, Left-hand Drive,  
Center Control,  
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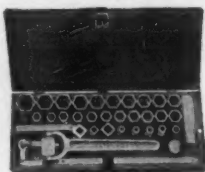
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Price no higher than for inferior sets.

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Fits any nut or  
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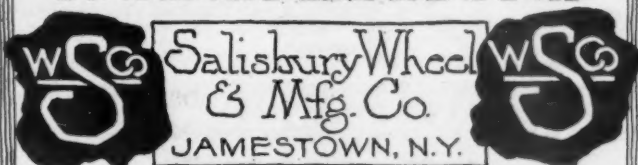
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With one of these effective  
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Observe the opposition  
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Four cylinders, 32-40  
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body types to meet  
every requirement and  
corresponding equip-  
ment.

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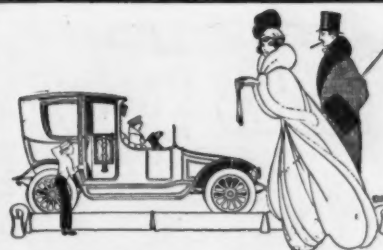
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IDENTIFY yourself with a company which is  
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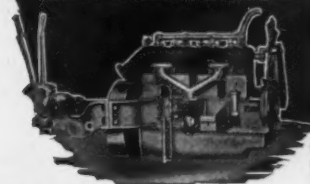
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We make them better and at less cost than you can,  
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## Model Gas Engine Works

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You have seen it—and admired it. Probably you did not know that it was a Robbins body. Probably you have wondered whose design and construction produced that handsome Sedan.

For your own comfort, you will need a Sedan body this winter.

LET US DESIGN IT

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## We Specialize in High-grade Automobile Parts

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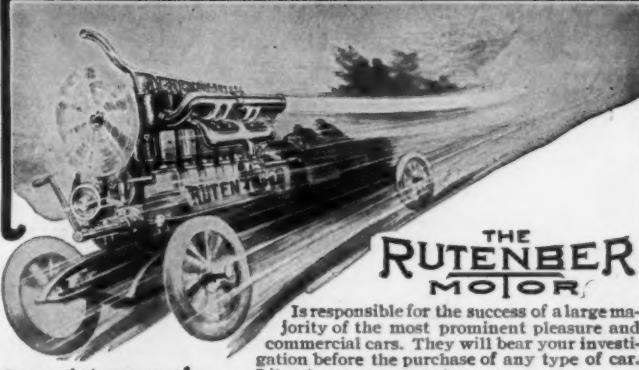
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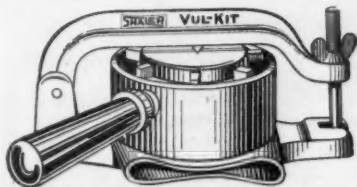
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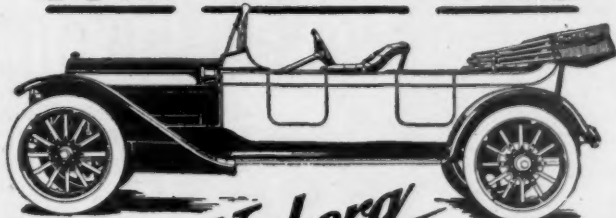
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Booklet 608



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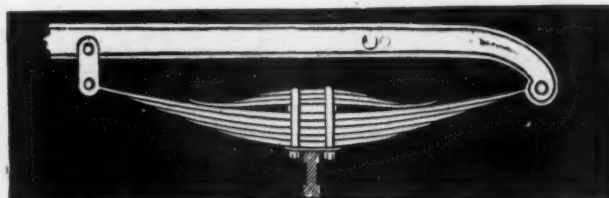
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Perfectly combine the functions of both thrust and radial bearings

Transmit Most Power Because They Have Least Friction

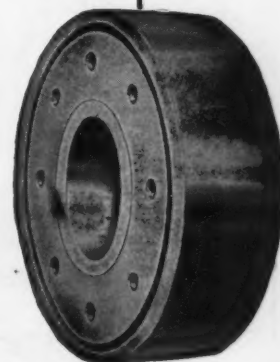
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(Front View)

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(View from Seat)



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**\$1850**

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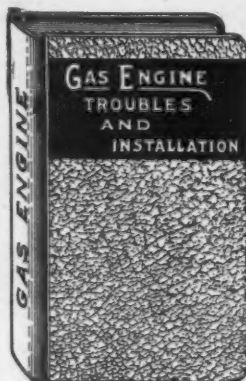
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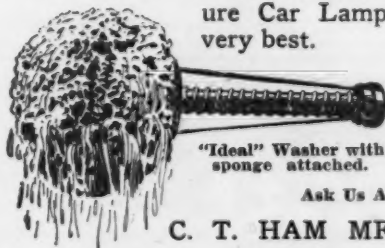
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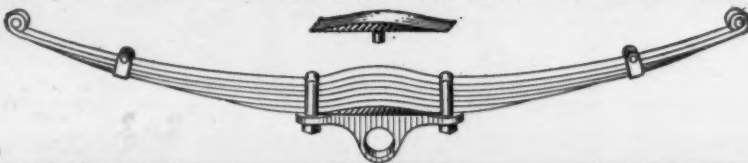
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Latest styles fore-door, 5-pass, 30" to 34" wide, 82" to 90" long, nicely painted and upholstered .....	100.00
1 1-ton truck, new, stake body, Davis motor, planetary transmission, Shel- don jackshaft, double side chains, 32x3½" Diamond solid rubber tires ..	700.00
1-ton truck axles (including hubs, bearings and brake drums) per set ..	35.00
1-ton truck jackshafts, each .....	25.00
One Everitt chassis, complete ready for body, 112" W. B., 34x4" tires, 1912 model .....	750.00
One Everitt 1912 touring car, good as new, 5-pass, body, Prest-O-Tank, 5 lamps, speedometer, top, windshield, spare tire rack, 34x4" Q. D. tires, silk mohair top .....	875.00

If you do not find in this list what you  
 want, write us and we will supply you.

**AUTOMOBILE SURPLUS STOCK &**

MFG. CO.  
 248-250 Jefferson Avenue,  
 Detroit, Michigan.

**FORD LIGHTING OUTFIT \$5.50**

Includes parabolic reflectors, tungsten  
 bulbs, wiring, switch and free delivery.  
 Truscott Auto Supply Co., St. Joseph, Mich.

**FORD OWNERS AND DEALERS!**

You will save trouble and money by in-  
 stallng our timer elevating device.  
 Ford Parts Specialty Co.,  
 1211 Main St., Richmond, Ind.

**FORD OWNERS**

A postal brings you our 1912 catalog of 22  
 necessities for your car. Auto Parts Co.,  
 Providence, R. I.

**FORD OWNERS WANTING FIVE ELEC-**  
 tric lights using Ford magneto for charg-  
 ing a storage battery (self contained sys-  
 tem), write American Battery Co., 1124 Ful-  
 ton St., Chicago.

**FORE DOORS**

Doors made for all makes of cars. Guar-  
 anteed prompt shipment and a very good fit.  
 We have patterns for most every car. F. E.  
 Lortz Co., 2503 E. 55th St., Cleveland, Ohio.

**FORE DOORS PUT ON ANY MAKE OF**  
 car. Guaranteed perfect fit. Also a num-  
 ber of used cars and foredoor bodies.  
 James E. Flew,  
 3rd floor, 2635 Wabash Ave., Chicago.  
 Calumet 5311.

**FOR SALE—THREE BOWSER PORTABLE**  
 gasoline garage tanks, complete, in good  
 condition. B. C. Hamilton & Co., 1218  
 Michigan Ave., Chicago.

**FORD AGENTS—WE MAKE A SPECIALTY**  
 of Dust Hoods to cover top when clashed  
 down, for Model T Ford 1910-1911-1912-1913  
 cars. Write for prices. Will save you money.  
 The H. A. Hawes Storm Front Co., Cold-  
 water, Mich.

**FORD OWNERS—OUR SPARE DEMOUNT-**  
 able wheel cures tire trouble on road. Doc-  
 tors attention. Write Angler's, Streator, Ill.

**FORD T OWNERS**

Foot throttle or accelerators, \$1.50. Lin-  
 coln Machine Shop, Lincoln, Ill.

**FOR SALE—COUPES FOR IMMEDIATE**  
 delivery. Stylish, up-to-date and well con-  
 structed. Fit almost any car. Write us.  
 Robbins & Co., Indianapolis, Ind.

**FOR SALE**

Large sight seeing body for sale. Quick  
 action necessary.

F. E. LORTZ COMPANY,  
 2503 East Fifty-fifth St., Cleveland, Ohio.

**FOR SALE—ONE LIMOUSINE BODY FOR**  
 Stearns 30-60 chassis. Body cost \$1,750  
 when new; used one season and in perfect  
 condition. Price, \$800 f. o. b. Louisville.  
 Louisville Lozier Company  
 Louisville, Ky.

**FRAMES, 34 INCHES WIDE—**

112 W. B. Straight, each .....	\$12.00
Frames, 36 inches wide—112 W. B. straight, each .....	14.00
Frames, 36 inches wide—124 W. B. straight, each .....	15.00
Unassembled frames—Kickup 112-inch W. B. 34 inches wide each .....	8.00
For assembling, each .....	4.00
Wheels—34x3½, 32x3½, per set—\$12.00- 10.00	
Axles—40-50 H. P. rear, each .....	50.00- 60.00
Radiators, 30 H. P. honeycomb each ..	15.00

Address Box D 169, care Motor Age.

**GUARANTEED****RADIATORS FOR ALL CARS**

The following is our stock list of radiators  
 for the cars mentioned, subject to immediate  
 shipment. Compare our prices with other  
 lists.

Ford Model "T" .....	\$18.00
Ford N. R. & S. (complete with pump) ..	23.00
Buick 10-32-33 .....	26.50
Buick F. ....	35.00
Hudson 20 .....	33.00
Buick 16-17-26-27-28 .....	35.00
Buick B-K-5-38-39 .....	42.50
Buick 19 .....	27.50
Anhut .....	20.00
Northern B. ....	18.00
Northern C. ....	35.00
Wayne A-C .....	25.00
Wayne N-30 .....	50.00

The following we offer subject to prior  
 sale, having a job lot:

**BETTER GET BUSY**

Abbott 30 .....	20.00
Abbott 44 .....	24.00
Autocar Radiator (Truck) .....	29.00
Cutting 40 .....	30.00
Grabowsky Trucks .....	30.00
Everitt 30 .....	14.50
Motor Wagon .....	14.00
Oakland M-K .....	35.00
Palge 1910 .....	13.50
Pullman M-O .....	26.00
Warren 40, 1912 .....	28.50

Terms: One-third cash with order, balance  
 C. O. D. or five per cent discount for cash  
 with order.

**AUTOPARTS MANUFACTURING CO.,**  
 Detroit, Mich.

**HAVE YOU TRIED THE NEW COTTER**  
 pin tool? No more skinning of hands; 15  
 tools in one, at \$1.00. For sale by E. M.  
 Worden, Ladysmith, Wis.

**KASTNER TIRE AND RIM CO.,**

2112 Michigan Ave., Chicago.  
 Standard Universal, quick detachable rims  
 in sizes 30x3, 34x3½, 32x4 at \$5.00 a set of  
 four, absolutely new. Also 30x3 one-piece  
 clincher rims at 50 cents each. Send for  
 cut of quick detachable rim and our new  
 rims part catalogue.

**LIMOUSINE BODY — 7-SEATED; HAND-**  
 buffed leather cushions; complete; nearly  
 new. Cincinnati Hide and Leather Co., Sta-  
 tion B, Cincinnati, Ohio.



**KEROSENE FOR AUTOMOBILES—OUR**  
new "Model B" uses successfully half and half mixture lowest grades kerosene and gasoline. Satisfaction guaranteed or money refunded. Starts easy at zero. Special agents' prices.

AIR-FRICTION CARBURETOR CO.,  
Dept. B, Dayton, Ohio.

**MACHINE SHOPS AND GARAGES—OUR**  
WELD IT ALL machines will weld perfectly any broken casting that has a melting point. Full particulars on Oxy-Acetylene welding machines sent on receipt of your address. Every machine fully guaranteed. H. D. Prose & Co., Wichita, Kansas.

**MAXWELL PUSH ROD ADJUSTERS**

\$1.50 for complete set delivered. Money back guarantee. Auto Parts Co., Providence, R. I.

**MORA REPAIR PARTS**

We purchased the repair business of the Mora Company and have in stock repair parts for all models of Mora cars. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

**MOTORS.**

- 75—Four cylinder motors, new with oiler and fan.....\$ 80.00
  - 115—Two cylinder opposed motors, new with oiler, carburetor, timer.... 50.00
  - 17—Two cylinder opposed 20 H. P. Davis motors, new..... 70.00
  - 52—Four cylinder Mitchell motors with magneto, carburetor, coil, oiling device..... 125.00
  - 120—Shaft drive axles, per pair..... 40.00
- Get our 700 Bulletin on repair parts.  
AUTO PARTS CO.,  
513-31 Jackson Blvd.,  
Chicago.

**MR. (FORD) OWNER AND GARAGE MAN**

—The Townsman Valve Adjuster has a cushion for your valve-stems. Takes away the click, absolutely silencing the valves. No screws or burrs to work loose. Saves putting in new push-rods and valve-stems. They never wear out. Price \$1.50 by mail. Ask your jobber, or address Townsman Auto Specialty Co., Mitchell, S. D.

**PEERLESS EXTRA FINE BLACK BAKING JAPAN.**

For baking on all metals, no primer, one coat covering solid. Bakes to a high gloss finish in 2 to 3 hours. Can also bake to a semi-gloss and dull finish. Ask your dealer. The Columbus Varnish Co., Columbus, Ohio.

**NICKEL PLATE YOUR AUTO TRIMMINGS**  
with Electro-Knickel. Prevents brass from tarnishing, iron from rusting. This is not a silver or mercury wash. We guarantee it plates (without a battery). Price \$1.00, express prepaid. Write for information. Gun Metal Finish Co., 313 Powers Block, Decatur, Ill.

**ONE OVERLAND 41-5-PASSENGER BODY**  
with top and slip cover, for sale cheap; almost new. Wray-Dickinson Sales & Garage Co., Shreveport, La.

**ONE STEAM TUBE PRESS, 5 LEVERS,**  
new; 1 solid rubber tire machine, new; 1 closing machine. Born Vulcanizing & Tire Agency, Belleville, Ill.

**ONE 4 CYL. 50 H. P. ENGINE.....\$50.00**  
Model B, No. 5, Stromberg carburetor. 10.00  
Model B, Prestolite tank..... 10.00  
Model D, 4 H. P. Bosch magneto..... 40.00  
Auto Salvage & Parts House,  
1436 Wabash Ave.,  
Chicago.

**OXY - ACETYLENE WELDING PLANTS.**  
The Admiral Welding Machine is the ideal welding device; large capacity; self-generating throughout; portable; complete in every detail; a perfect machine for all work, large or small. Send for our booklet "Welding" and full description. Price \$200 f. o. b. Kansas City. Admiral Mfg. Co., 715 Lydia Ave., Kansas City, Mo.

**PEERLESS BACK & CUSHION DRESSING.**

For leather seats and cushions. Dries hard on clean leather. The color does not come off. Renews the finish. Ask your dealer. The Columbus Varnish Co., Columbus, Ohio.

**PENNANTS FOR AUTOMOBILES MADE**  
in rights and lefts from any colored felts desired; size 12x30. Price \$1.00 per pair. Cash with order. Liberal discount to dealers. J. C. Orcutt Co., Inc., Lincoln, Neb.

**PROTECT YOUR CAR**

**Combination Ignition Locks**

Your car cannot be stolen if it is equipped with an Auto Combination Lock. Insurance that insures. It is simple, quickly applied, is adaptable to any car. The lock is easy to operate, and it is absolutely impossible to run the car without the combination. Ask the man who owns one. It is the cheapest and safest and represents the highest class of theft insurance.

The Auto Combination Lock Co.,  
1467 S. Michigan Ave., Chicago.

**PUNCTURFIX SEALS PUNCTURES**  
automatically—fixes punctures while riding, without loss of air; increases mileage of tires and pleasure of riding 100%. Call and witness demonstration or write. Money making territory now open to hustlers. Chicago Motor Co., 1157 S. Wabash Ave., Chicago.

**RADIATORS—NEW GUARANTEED GOODS**

Ford, Model T.....\$16  
Buick Model 10..... 22  
Buick Model F..... 25  
Chalmers-Detroit..... 20  
Everett..... 20  
Stoddard-Dayton..... 25  
And any other make required at equally low prices.

Times Square Automobile Co.,  
1210-1212 Michigan Ave., Chicago.

**REPAINT YOUR CAR YOURSELF—WITH**  
our materials and full instructions, you can repaint your car as well as a regular painter and save from \$25 to \$50, depending on its size. Previous experience unnecessary. Latest colors. Write today for full information and color cards. We also make Liquid Gun Metal, the National Brass Enamel, \$1 a can, express prepaid. The only articles of proven merit for lamps, radiators, etc. No polishing. Arsenal Varnish Co., Automobile Dept., Rock Island, Ill.

**REPAIR PARTS FOR ANY MAKE CAR AT**  
less than factory prices. Chicago's original gas engine men. Alexander & Cox Co., Ogden and Western Aves., Chicago.

**PEERLESS EXTRA FINE BLACK JAPAN.**

For all metal, lamps, radiators, fenders, etc. Air dries in 10 to 12 hours with a high gloss finish. Elastic, tough, durable. No primer; one coat covers solid. Ask your dealer.

The Columbus Varnish Co., Columbus, Ohio.

**SCHEBLER MODEL "L" CARBURETORS,**  
new, 1½ or 1¼-inch, \$8.00 each. This factory overstock nearly gone. Order early. Kent Motor Car Co., Kenosha, Wis.

**SEAT COVERS FOR ALL CARS—SPECIAL**  
price on Fords. We clean old covers; make them look like new. Auto Cape Top Co., 2334 Michigan Ave., Chicago.

**SPEEDOMETER, STEWART & CLARK, 50**  
mile, complete. Practically new. Perfect condition. Cost \$15. Sell \$10, C. O. D. J. A. Hetrick, Gladstone, Mich.

**STEVENS AUTO TIRE VALVE**

Adopted by Ralph De Palma, winner of the Vanderbilt Cup at Milwaukee, 1912. Can be attached instantly without any expense to any inner tube stem on any car. Saves one-half the time and labor necessary to inflate tires by any other method. Easily adjusted. Warranted not to leak. 200,000 in use. Send \$1.00 for set of four. Try them 30 days and if not satisfactory money will be cheerfully refunded. Stevens Manufacturing & Supply Co., 504 Fisher Bldg., Chicago.

**TAKE THE RATTLE OUT OF YOUR CAR.**

Make it quiet. Anti-Rattle applied as directed to all worn parts and loose connections will do the trick. Easily applied. Send one dollar to Anti-Rattle Co., Wallingford, Conn.

**TOPS BUILT, RECOVERED AND RE-**

paired.  
C. G. Meyer & Son, Tiffin, Ohio.

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**Motor Age**  
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**See Next Page!**

**TOURING, ROADSTER, RACING BODIES.**  
Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,  
2228 Michigan Ave., Chicago.

**\$1.50—CARBURETORS, 1 1/4" VERTICAL IN-**  
take Kingston, floating ball type, second hand but in good condition, used for testing only. New double bucket roadster seats, upholstered and painted, with cushions, \$20; gasoline tanks, 30x9x15, \$2; Mosler 4 cyl. timers, \$1.50 each; Leavitt 4 cyl. timers with 3/4" shaft, new, \$2. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

**\$325.00 36 H. P. MOTORS, \$150.00.**  
4-cylinder, twin construction, aluminum crank case, 3 bearing crank shaft, 1-piece cam shaft. Completely equipped. Guaranteed 1 year. Full details on application.  
Oakbrook Motor Mfg. Co.,  
Reading, Pa.

### Parts and Accessories WANTED

**GAS TANKS WANTED**  
Cash paid for Prest-O-Lite tanks in any quantities. Address F. E. Breakey, 734 Oakwood Blvd., Chicago, Ill.

**WANTED—A SMALL 4-CYLINDER 4-**  
cycle Enbloc Motor, about 15 or 20 h. p., complete with magneto and pump.  
SNEATH GLASS CO.,  
Hartford City, Ind.

### Auto Wearing Apparel

**ATTENTION AUTO OWNERS**  
A genuine English slip-on Auto Rain Coat. Guaranteed waterproof at \$6.00. You are buying direct from manufacturer. Send money order. Express prepaid. National Rubber Rain Coat Co., 310 E. State St., Rockford, Ill.

**ATTENTION—HAVE A FEW MANUFACTURER'S** samples, gentlemen's black broadcloth fur lined overcoats lined throughout with Australian mink. Large, genuine Persian lamb collars, sizes 36 to 48. Value, \$75; will sacrifice for \$35 each. Also several ladies' handsome long fur coats, satin lined, worth \$90, while they last, \$35; and a few large size fur robes, plush lined, \$15 each. All guaranteed new. Examine before buying. Send express charges. Will send on approval. Write or call, E. Roberts, Room 6, 160 West 119th St., New York.

### For Sale or Exchange

**FOR SALE OR EXCHANGE**  
1 5-horsepower, 2-cylinder, 2-cycle Holliday marine engine; 1 3-horsepower, single cylinder Grey engine; 1 Gies reverse gear, suitable for 5-horsepower engine; 1 1912 Indian Motorcycle, nearly new, single cylinder with Bosch magneto and free clutch. Will sell cheap. Address W. I. Torboss, Hebron, McHenry Co., Ill.

**FOR TRADE—320 ACRES, NEAR DICKER-**  
son, N. D., clear of incumbrance. Will trade for automobile garage and stock. If interested will give full description of the land. E. B. Collins, Danville, Ill.

**WILL EXCHANGE SECOND-HAND AUTO-**  
mobiles for motorcycles. Allen Motor Co., Norfolk, Va.

### Situations Wanted

**A1 TIRE REPAIR MAN WITH GARAGE**  
experience, will be open for engagement about April 15, 1913. I am an expert tire vulcanizer and a reliable automobile mechanic. Address Box D 274, co Motor Age. c

#### EXPORT

American, residing at Berlin, is seeking the agency for a leading auto concern for Germany. At present identified with an English corporation. Is highly responsible and connected with leading societies. Address P. O. Box 55, Chicago, Ill.

**EXPERIENCED GAS-TRACTION ENGINEER**  
and machinist wants position as gas-engine operator or as an auto-truck driver. Have worked in auto-repair shops and have driven some high powered cars and trucks. Am operating a 60 h. p. Hart Parr gas-tractor now on a big ranch. Furnish reference; married. Address Box D, 281, c/o Motor Age. y

**HIGH GRADE SALESMAN, NOW EM-**  
ployed, who is also a mechanical engineer and possesses excellent business ability, desires position where he will not have to travel ALL the time. Have a wide acquaintance in the automobile and auto parts industry. Am 34 years old and very energetic. Address Box D 296, c/o Motor Age. k

**POSITION AS DESIGNER AND DRAFTS-**  
man; ten years' experience in automobile business; thoroughly familiar with shop work and all kinds of drawings. Address Box D 290, c/o Motor Age. v

**PURCHASING AGENT OR ASSISTANT—**  
Three years' experience, of good habits, open for engagement March 1, 1913. Address Box D 270, c/o Motor Age. d

#### SALES MANAGER

Experienced business man with very wide trade acquaintance wishes to market output of truck factory on salary and commission basis. Box D 238, c/o Motor Age. f

**SITUATION WANTED—AS CHAUFFEUR**  
either commercial or touring; best of references and married. Address Box D 297, c/o Motor Age.

**TECHNICAL MAN, SEVEN YEARS AT**  
motor trucks, advertising, purchasing and sales department. Intimately acquainted with Pacific Coast trade, successful record. Desires connection with truck mfr. or as parts salesman. Box D 295, c/o Motor Age. h

**WANTED—POSITION AS FIELD AUTO**  
salesman in Michigan. Have thorough knowledge of both retail and wholesale methods; am considered to be a first-class, resourceful business producer; will guarantee to make good. Desire connection with first-class house where the services of a high-class man will be appreciated.

Address Box D 289, c/o Motor Age. m

**WANTED—POSITION AS REPAIRMAN OR**  
as demonstrator; five years' experience. Best of references; no boozier; American; 23 years old. Wish steady work. G. E. Derkins, Magnolia, Minn.

### Help Wanted

#### AAA OPEN POSITIONS

With automobile concerns exclusively. Are just as represented, not "catchy ads." All information confidential. If you are a good man, we want you. Write us today. We may have an opening in your city.

We have stood the test for 10 years. An enormous engineering Department.

Designer, \$2,500, light car; Works Manager, \$3000-\$5000, axles and parts; Works Manager, \$4000-\$6000, trucks; Lay-Out Man, \$1200, pleasure chassis; Inspector, \$1500-\$1800, machine dept.; Demonstrator, \$1200, engines; Production Man, \$2500; Assembly Demonstrators, \$1200-\$1500; Designer, \$1500, compressors; Designer, \$1500-\$1800, tools and jigs; Designer, \$2500-\$4000, engines; Foreman, \$1500-\$1800, machine shop; Woodwork Foreman, \$1500, bodies; Apprentice Director, \$1800-\$4000, train shop men; Several Bookkeepers, Clerks and Salesmen; 6 machinists, 40-45c, lathe, boring mill and dies. Over 50 openings for all kinds shop help, at best wages. Write us immediately. DO IT NOW.  
BUSINESS MEN'S CLEARING HOUSE,  
323, 108 S. La Salle St., Chicago.

#### MANAGER OR SUPERINTENDENT

Mechanical engineer with splendid practical shop and commercial experience. Expert in the up-to-date manufacture of interchangeable machinery and parts. Resourceful in design and methods for reducing costs and increasing production. Good organizer and system man with excellent executive ability. Splendid record and references, at present engaged but for good reasons desire change. Address Box D 293, c/o Motor Age. s

**MECHANICAL ENGINEERS, SUPERIN-**  
tendents, works managers and designers wanted. The Engineering Agency, Inc., Monadnock Bldg., Chicago.



### AUTOPARTS MFG. CO.

MANUFACTURERS  
TREMBLY AVE., COR. ORLEANS

DETROIT, MICH. August 1st, 1912.

The Motor Age,

1501 Ford Bldg.

Detroit, Mich.

Gentlemen:—

I am surprised to note the wide field covered for Motor Age, we carrying as you know a large classified advertising continuously with you and not only get tremendous results from United States, but in one mail yesterday we received six foreign inquiries to wit: one from Mexico, One from Australia, one from England, one from Germany, one from Belgium and one from Panama. It is quite a surprise to us to note the wide fields covered by your paper.

I am enclosing you herewith the envelopes that these inquiries were received in.

Very truly yours,

*Alfred D. Dunk*  
ALFRED D. DUNK CO.  
PRESIDENT.

A.O.D.:E.S



**A LICENSED A. A. A. RACING DRIVER**

wishes to sign up with private owner or factory for 1913 races. He has driven in road and track races with success Address Box D 287, c/o Motor Age. m

**SALESMAN—ONE WHO IS NOW VISITING** automobile trade or owners. Good money made on a very attractive proposition. Sturdy Mfg. Co., 2637 Michigan Av., Chicago.

**WANTED—A NO. 1 FORD MECHANIC.** One who understands Ford cars thoroughly; steady work; state salary expected. Moore Automobile Co., Grand Forks, N. D.

**WANTED—A1 REPAIRMAN WHO WILL** work and stay in a town of 2,000. Rohde Bros., Rock Rapids, Iowa.

**WANTED—CARBURETOR EXPERTS TO** conduct factory tests. Must understand motors, ignition and carburetion. Excellent opportunity for a competent man. State experience and salary expected. Address Carburetor Manufacturer, Box D 294, c/o Motor Age. f

**WANTED—FIRST-CLASS CHECKER, EX-** perience in commercial truck work. State experience, age, salary, etc. Address Asst. Engineer, Kelly-Springfield Motor Truck Co., Springfield, O.

**WANTED—GOOD, RESPONSIBLE SALES-** men to act as our exclusive representatives in States not now contracted, to sell our new invention for automobiles, the "Automatic Speeder and Primer." Gives 25 to 50% more mileage on gasoline consumed, and does it "automatically." One demonstration of this invention satisfies the most skeptical. Prefer men with car. Write: Automatic Device Co., Frankfort, Ind.

**Radiator and Lamp Repairing**

**A-A-A RADIATORS MANUFACTURED** and repaired. Radiators of any make repaired and returned same day. We can make any style radiator and ship in three days. Sheppard Co., 1331 Jackson Blvd., Chicago.

**AA1 AUTO LAMP REPAIRING**

All Radiators Repaired by expert workmen. All work guaranteed by the Michaud Metal Works, 1615 Wabash Ave., Chicago. Tel. Cal. 5286; Auto. 67-337.

**ALL KINDS OF AUTO RADIATORS,** hoods, fenders and lamps, etc., rebuilt and repaired. Also general sheet metal work. Phone or mail order. L. Blumenfeld & Co., 1919 Wabash Ave., Chicago. Tel. Cal. 4583.

**ARROW RADIATOR REPAIR CO.,**

1331 Wabash Ave., Chicago. Expert repair work on Radiators, Hoods, Fenders, Dashes, Tanks and Drip Pans. We guarantee all our work. Phone Cal. 1995.

**CHICAGO MANUFACTURING COMPANY,** 1466 Michigan Ave., Chicago.

Manufacturers of Radiators, Hoods, Fenders and Tanks. New Cores placed in old radiators. First-class repairing. All work guaranteed.

**ILLINOIS AUTO SHEET METAL WORKS**

1559 Michigan Ave., Chicago. The leaders in the repairing and manufacturing of radiators, hoods, fenders, etc. A trial will convince you. Orders shipped 3 days after receipt. Phone Calumet 1191.

**ONLY RADIATOR FACTORY IN NORTH-**

west. Eleven years' knowing how. Why send your Radiator down East when you can ship it to us; save Time, Express, Freight, Money, and get best workmanship. Prices right. Make new Radiators; allow for old one.

Todd Manufacturing Co.,  
820 Mary Pl., Minneapolis, Minn.

**RADIATORS**

We make good where others fail in repairing and manufacturing Radiators and Fenders. **IDEAL SHEET METAL WORKS,** 2809 S. Michigan Ave., Chicago. Ph. Cal. 3699.

**THE M. & L. AUTO SHEET METAL** Works rebuild and repair radiators, hoods, fenders, tanks, lamps, etc.  
1551 Michigan Ave., Chicago, Ill.  
Tel. Cal. 2348.

**Ignition Repairing**

**IGNITION AND LIGHTING APPARATUS** repaired successfully where others fail. Parts in stock for all makes. Send your next work to us and be convinced. Catalogue sent free. Pellet's Magneto Exchange, 1463 Michigan Ave., Chicago, Ill.

**Rebuilding and Repairing**

**ANDRE G. CATELAIN**  
Automobile Garage and  
General Machine Work  
For Foreign and American Cars  
Welding all kinds of metal  
Manufacturer Catelain Hose Coupling,  
1446-8 Indiana Ave. Tel. Calumet 1187  
Chicago.

**AUTOMOBILE CYLINDERS REGROUND,** new pistons and rings fitted. Garage Air Compressors. Cast Iron Brazing Co., Manchester, N. H.

**BROKEN CYLINDERS AND CRANK-** cases—Send them to be made good as new at fraction of replacement cost. Scored cylinders repaired, \$12. No new pistons and rings required because bore not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. Waterbury Welding Company, Waterbury, Conn.

**CYLINDERS REGROUND AND FITTED** with new pistons and rings from \$7 to \$11 per cylinder. Gear cutting in steel, brass, rawhide, fiber, etc. Send us your old parts and we will make you new ones like originals, often cheaper than you can get them from the manufacturer. The Crown Machine Shop, Crown Point, Ind.

**CYLINDERS REBORED, PISTONS AND** rings fitted: \$8.00 to \$12.00 per cyl.; gear cutting in nickel steel, rawhide, fiber, brass, etc. Crankshafts, connection rods, gear sets, axles, crankcases, reproduced like original; send broken or worn parts to go by. The Shop of Quality.  
McCadden Machine Works,  
St. Cloud, Minn.

**CYLINDERS REGROUND** and fitted with new pistons and rings for \$15 per cylinder. We make parts and cut gears of all kinds. Send us your old parts and we will repair or duplicate them in record time. Cracked cylinders, gear cases, etc., welded and made good as new. Aluminum, bronze and brass castings of every description. The Adapt Machinery Co., 1624 Wabash Ave., Chicago, Ill.

**NEED A CAR DOCTOR?**

Consult us; the people that know how to repair radiators, hoods, fenders, etc. Every repair goes out under our guarantee. We solicit a trial that will convince you that we are the leaders in this business.

**AUTO COMBINATION LOCK CO.,**  
1469 Michigan Ave.,  
Chicago.

**NOTICE—AUTOMOBILE AND GARAGE** owners. Free expert advice on troubles, where and how to find them. Repair Parts. Old Models, where and how to get them at the Right Price. Engineering Specialist, Goshen, Ind. Inclose stamp for reply.

**POWERFUL AND QUIETER MOTORS ARE** guaranteed by us where we regrind your cylinders, with new pistons and rings to fit; the charge is \$10 complete per hole; accuracy guaranteed. Merritt Co., 311 West Fifty-ninth St., New York City.

**WABASH AUTO CONSTRUCTION WORKS**  
1523 Wabash Ave.,  
Chicago.

The leaders in overhauling and repairing automobiles. Our plant is completely equipped with machinery and welding outfit. A trial will convince you. All work is guaranteed.

Telephone Calumet 670.

**Tires****TIRES**

One-half price, new and slightly used. 1912 stock, just received from manufacturers in Akron, Ohio. All the stock must be sold to make room.

**SERLIN TIRE CO.,**  
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### At the Same Time

No need to risk frost-bitten fingers and work with the pump, in order to insure against skidding.  
Kill both birds by equipping your tires with

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CAMBRIDGE - MASS.

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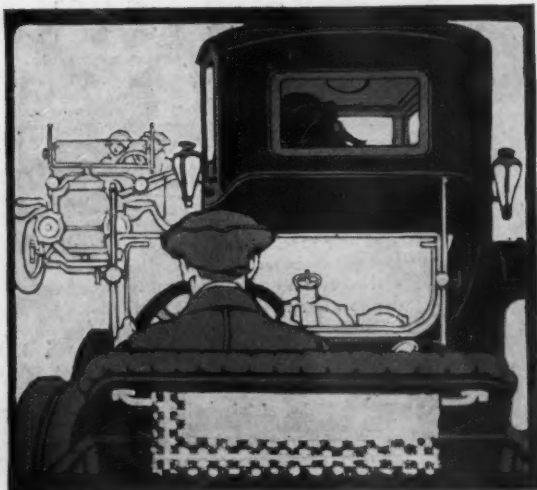
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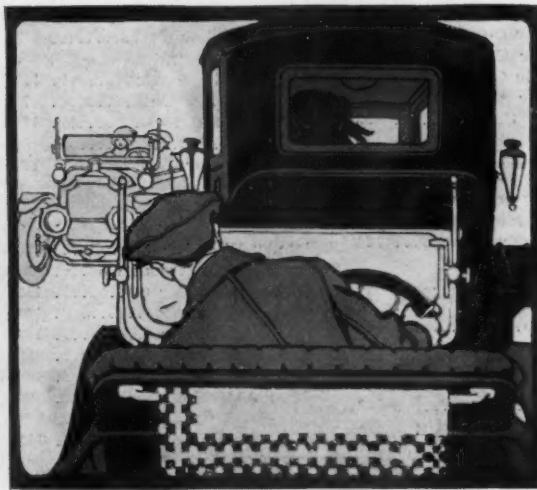
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## Convenience, Security, Maximum Service Packard Left Drive Motor Carriages

*The New "38"*

*The New "48"*

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When turning off to the left in traffic, your protection is assured by a position convenient for signalling with left arm.

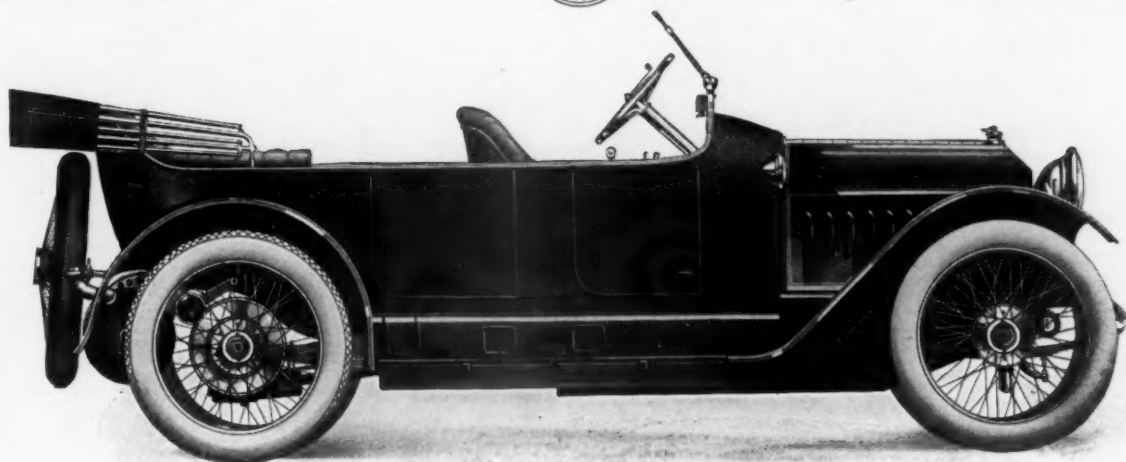
When turning off to the right, you are naturally protected by the adjacent curb.

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A natural and safe ratio of power to weight is essential to reliability, sturdiness and economy. When the highest standard of materials and workmanship are combined with common sense in design a ratio of one-horse power per 100 lbs. weight is always safe—the ratio of the Edwards-Knight.

**Economy in Gasoline Consumption**

High priced gasoline compels attention. Comparatively small power units economize gasoline. A low gear ratio with direct on third makes a snappy car with high speed possible on fourth gear.

**The elimination of exorbitant tire bills**

That Wire Wheels add life to tires has been demonstrated by exhaustive tests in Europe, where they are universally used, and, when combined with the right Spring Suspension, maximum tire life is assured.

**Silence**

The Knight Engine, admittedly the most silent of all gasoline engines, combined with a Worm Drive Rear Axle, results in an elimination of noise which is only equalled by electrics.

**Comfort**

Silence, combined with a Spring Suspension which precludes the possibility of sudden jolts and jars, or the need of shock absorbers, means comfort. The Edwards-Knight is the easiest riding car in the world—yes, we mean just that and can prove it.

These points, combined with graceful body designs, elegant fittings and other features, make the Edwards-Knight the easiest selling car on the market.

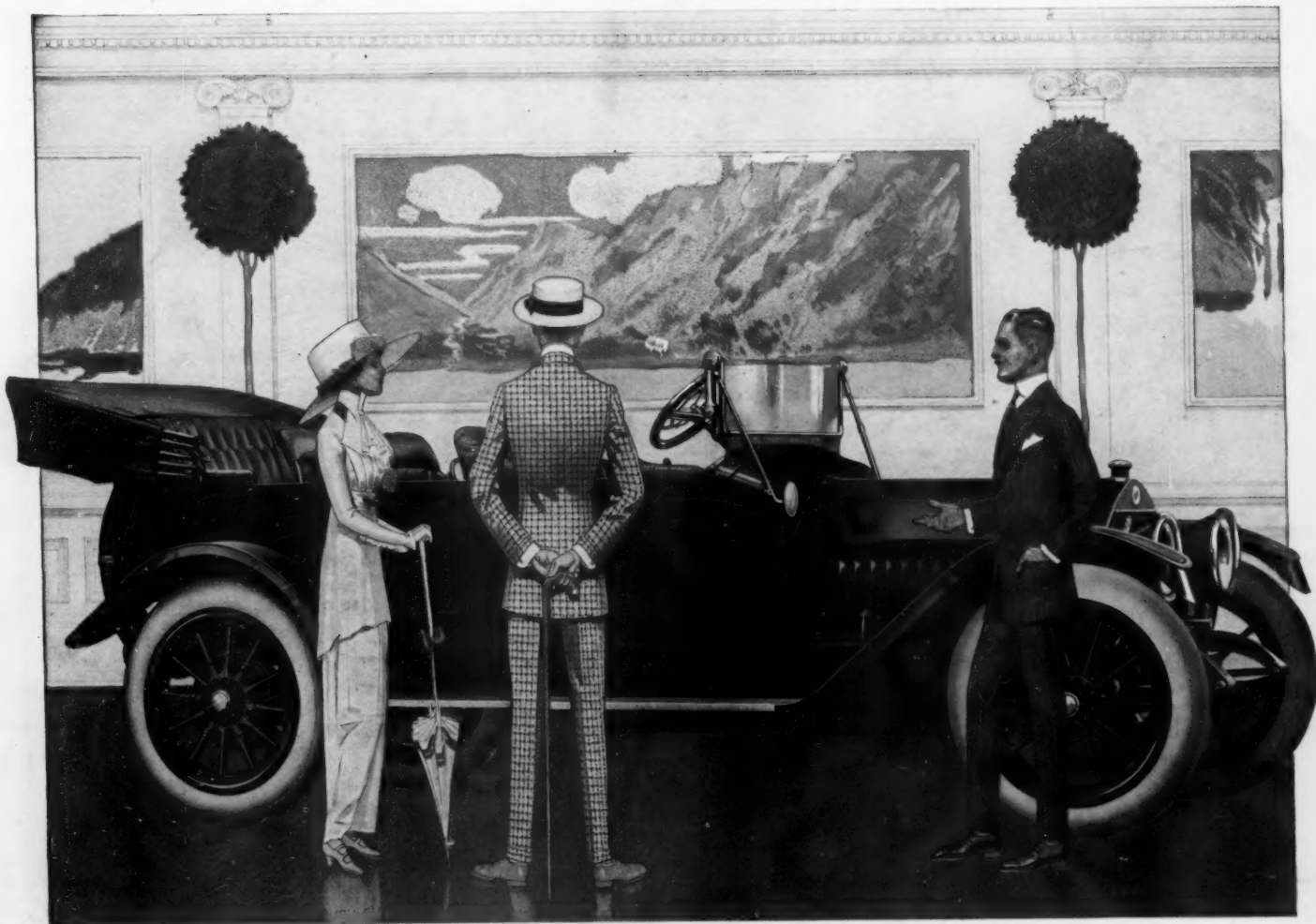
Touring Car, \$3500; 4-Passenger Torpedo, \$3500  
Speedster, \$3500; Roadster, \$3500; Limousine, \$4600

*Every Car fully equipped*

Agents who follow closely the trend of the times, who are quick to take advantage of changing tendencies to increase their sales, will be interested in the Edwards-Knight proposition. Write today for full particulars.

The EDWARDS MOTOR CAR CO., 1790 Broadway, New York (Entire Fourth Floor)





## A Shortage of Cars With These Features

Is the car you are considering buying up to date, half up to date, or is it out of date? The car which is only half up to date is behind the times. The UP-TO-DATE car has

Would you consider a car up to date without ALL of these features?

Left Hand Drive  
Six Cylinders  
Flush Side Bodies  
No Projecting  
Hinges  
Clean Running  
Boards  
Electric Lights  
Self Starter  
Tire Inflator

WHAT MAKER BESIDES PREMIER was offering in August, 1912, a six-cylinder car?  
WHAT MAKER BESIDES PREMIER was offering in August, 1912, a six-cylinder car with left hand drive?

WHAT MAKER BESIDES PREMIER was offering in August, 1912, a six-cylinder car with left hand drive, flush side bodies, no projecting hinges, and clean running boards?

WHAT MAKER BESIDES PREMIER was offering in August, 1912, a six-cylinder car with left hand drive, flush side bodies, no projecting hinges, clean running boards and electric lights, and a starter?

WHAT MAKER BESIDES PREMIER was offering in August, 1912, a six-cylinder car with left hand drive, flush side bodies, no projecting hinges, clean running boards and electric lights, starter, and tire inflator?

A number of different makers, since the latest Premier came out, have added some of these various latest and more approved features to the line they are now offering, but what car besides Premier embodies all these features even today? None.

Are you interested in a car in which any of these features are missing? Even one or two obsolete features stamp a car out of date—behind the times

Premier has delivered to date three times the number of cars delivered in the same period last year. The secret of this Premier prosperity is not only because Premier is so highly regarded as a car, but because of the completeness of Premiers this year. The six-cylinder Premier of today is backed by seven years' experience in the building of successful six-cylinder cars.

De Luxe catalog and full information furnished upon request

## PREMIER MOTOR MFG. CO., Indianapolis, Ind.

Premier Six as Pilot in 1907  
Glidden Tour

Premier Six laying out 1908 Glid-  
den Tour in Ransley Lake District

Premier Six, Chairman's pace-  
making car, starting from Detroit  
on Glidden Tour

Premier Six in the gumbo swamps  
of Tennessee in Glidden Tour

Premier Six, Pilot of famous  
Ocean to Ocean Tour in 1911

The start of the Indiana Four  
States Tour of the Premier Six  
and Premier Prairie Schooner,  
which crossed the Continent with  
the Ocean to Ocean tourists, in  
1911

